Nos. 23-1067, 1068

IN THE

Supreme Court of the United States

OKLAHOMA, *et al.*,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

PACIFICORP, *et al.*,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE TENTH CIRCUIT

JOINT APPENDIX

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PETITIONS FOR CERTIORARI FILED MARCH 28, 2024
CERTIORARI GRANTED OCTOBER 21, 2024

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APPENDIX A — EXCERPTS FROM OKLAHOMA 2015 OZONE INFRASTRUCTURE AND TRANSPORT SIP (EPA-R06-OAR-2021-0801-0005), DATED OCTOBER 25, 2018

Michael J. Teague
Secretary of Energy & Environment

Mary Fallin
Governor

STATE OF OKLAHOMA
OFFICE OF THE
SECRETARY OF ENERGY & ENVIRONMENT

204 N. ROBINSON, SUITE 1010 • OKLAHOMA CITY, OK 73102 • 405-285-9213 • FAX 405-285-9212

October 25, 2018

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

Anne Idsal, Regional Administrator (6RA)
U.S. Environmental Protection Agency—Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Subject: Certification of SIP Elements for the 2015 Primary and Secondary Ozone NAAQS under Clean Air Act Sections 110(a)(1)-(2)

Dear Administrator Idsal:

In a letter dated September 24, 2013 Governor Mary Fallin appointed me as her designee for the purpose of submitting documents to the U.S. Environmental

Protection Agency (EPA) for approval and incorporation into the State Implementation Plan (SIP) for the State of Oklahoma. The Oklahoma Department of Environmental Quality (DEQ) is given the primary responsibility and authority to prepare and implement the state's air quality management plan under Oklahoma Statutes.

Sections 110(a)(1) and (2) of the Clean Air Act requires that each state review and revise as necessary its SIP following promulgation of a revised National Ambient Air Quality Standards (NAAQS) (See U.S.C. § 7410(a)(1) and (2)). On October 1, 2015, the EPA administrator signed the Primary National Ambient Air Quality Standards for Ozone (80 Fed. Reg. 65292, October 26, 2015). EPA issued the "Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2)" in September 2013. Under this guidance, states may certify that their existing SIPs meet the "infrastructure" elements of § 110(a)(2), rather than submitting a revised SIP for the revised NAAQS such as the 2015 Ozone NAAQS. Oklahoma's SIP is codified in 40 CFR Part 52, Subpart LL.

On behalf of the State of Oklahoma, I hereby certify that, as indicated in the enclosed table titled "Oklahoma's State Implementation Plan (SIP) Submittal 'Infrastructure' Checklist," and the enclosed Technical support document titled "Oklahoma Demonstration of Compliance with the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 Ozone National Ambient Air Quality Standard," Oklahoma's SIP meets the infrastructure and Good Neighbor obligations for the

2015 Primary and Secondary Ozone NAAQS. To date, the only SIP change required to meet the revised 2015 Ozone NAAQS was a revision to Appendix E and F of OAC 252:100, to add the new 8-hour Ozone standard [CAA § 110(a)(2)(H)], which became effective September 15, 2016.

State public participation procedures for such SIP submittals were submitted to EPA for review under 40 CFR § 51.102. In a letter dated August 23, 2012, EPA concurred that Oklahoma's procedures are consistent with the requirements of 40 CFR § 51.102 and associated guidance. Public notice for this submittal was posted on DEQ's web site on August 15, 2018, to allow the opportunity to provide comments and to request a public hearing preliminarily scheduled for September 17, 2018 at DEQ's Central Office.

No hearing request was received during the minimum 30-day comment period (8/15/18—9/14/18). Therefore, a notice of hearing cancellation was published on DEQ's website on September 14, 2018. Attached is documentation of the public notice and submittal process. Also attached are copies of comments received during the comment period and a Response to Comments document. It is our understanding that the final results of EPA's review of this submittal will be determined through rulemaking and will be published in the *Federal Register*.

Please note that Oklahoma currently has no designated Ozone nonattainment or maintenance areas so no nonattainment plans are due.

If you have questions, please contact Mr. Eddie Terrill, Director, Air Quality Division, Department of Environmental Quality at (405) 702-4100.

Sincerely,

/s/ Michael Teague
Michael Teague
Secretary of Energy and Environment

Appendix A

Oklahoma Demonstration of Compliance with the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 Ozone National Ambient Air Quality Standard

October 2018

Oklahoma Department of Environmental Quality
707 N Robinson
Oklahoma City, OK 73101

Oklahoma 2015 Ozone Transport SIP

Appendix A

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Appendix A

[TABLE INTENTIONALLY OMITTED]

Oklahoma Demonstration of Compliance with the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 Ozone National Ambient Air Quality Standard

1.0 Introduction

Sections 110(a)(1) and (2) of the Clean Air Act (CAA) require all states to adopt and submit to the Environmental Protection Agency (EPA) any necessary revisions to its State Implementation Plans (SIP) which provide for the implementation, maintenance, and enforcement of a new or revised National Ambient Air Quality Standard (NAAQS). Such revisions are commonly referred to as "infrastructure SIPs." The EPA revised the ozone NAAQS in October 2015 and completed the designation process to identify most nonattainment areas in April 2018, and finalized designations on July 25, 2018. The Oklahoma Department of Environmental Quality (DEQ) is submitting this document to satisfy the transport SIP requirements of CAA Section 110(a)(2)(D)(i)(I), which is commonly referred to as the "Good Neighbor" provision.

2.0 Request

CAA section 110(a)(2)(D)(i)(I) prohibits emissions from states that will contribute significantly to nonattainment or interfere with maintenance in any other state with respect to any primary or secondary NAAQS. However,

Appendix A

EPA stated in the notice for the Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS ("2016 CSAPR Update"), that "… EPA does not view the obligation under the good neighbor provision as a requirement for upwind states to bear all of the burden for resolving downwind air quality problems. Rather, it is an obligation that upwind and downwind states share responsibility for addressing air quality problems. If, after implementation of reasonable emissions reductions by an upwind state, a downwind air quality problem persists, whether due to international emissions or emissions originating within the downwind state, the EPA can relieve the upwind state of the obligation to make additional reductions to address that air quality problem. But the statute does not absolve the upwind state of the obligation to make reasonable reductions in the first instance." [81 Fed. Reg. 74536, 26 Oct 2016]

The State of Oklahoma, through DEQ, is requesting the EPA to approve the *Oklahoma Demonstration of Compliance with the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 Ozone National Ambient Air Quality Standard* as a revision to the SIP. This revision supplements EPA's *Determination Regarding Good Neighbor Obligations for the 2008 Ozone National Ambient Air Quality Standard* proposal [83 Fed. Reg. 31915, 10 July 2018], in which EPA finds that the 2016 CSAPR Update fully addresses CAA section 110(a)(2)(D)(i)(I) (i.e., "Good Neighbor") requirements for Oklahoma.

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3.0 Background

On October 26, 2015, EPA promulgated a revised NAAQS for ozone based on 8-hour average concentrations [80 Fed. Reg. 65292]. EPA revised the level of the 8-hour ozone NAAQS to 0.070 parts per million (ppm). EPA completed the designation process to identify nonattainment areas in April 2018; all areas of Oklahoma were designated as attainment/unclassifiable [83 Fed. Reg. 25825, 4 June 2018].

Pursuant to section 110(a) of the CAA, states are required to submit SIPs to provide for the implementation, maintenance, and enforcement of a new or revised NAAQS within three (3) years following the promulgation of such NAAQS, or within a shorter period as EPA may prescribe. More specifically, section 110(a)(1) provides the procedural and timing requirements for SIPs. Section 110(a)(2) lists specific elements that states must meet for "infrastructure" SIP requirements related to a newly established or revised NAAQS. These requirements include basic SIP elements such as requirements for monitoring, basic program requirements, and legal authority that are designed to assure attainment and maintenance of the NAAQS.

On January 28, 2015, DEQ submitted a plan to satisfy the requirements of section 110(a)(2) of the CAA for the 2008 ozone NAAQS. This submittal addressed the following infrastructure elements, or portions thereof: section 110(a)(2)(A), (B), (C), (D), (E), (F), (G), (H), (I), (J), (K), (L), and (M) of the CAA. On December 9, 2016, EPA approved the submittal [81

Fed. Reg. 89008]. DEQ did not make a submittal to address the transport portion, (§110(a)(2)(D)(i)(I)) of the Infrastructure SIP, and on July 13, 2015, [80 Fed. Reg. 39961], EPA made a *Finding of Failure To Submit a Section 110 State Implementation Plan for Interstate Transport for the 2008 National Ambient Air Quality Standards for Ozone* for 24 states, which included Oklahoma. This finding of failure to submit establish a 2-year deadline for EPA to promulgate a Federal Implementation Plan (FIP) to address the interstate transport SIP requirements pertaining to significant contribution to nonattainment and interference with maintenance unless, prior to EPA promulgating a FIP, the state submits, and the EPA approves, a SIP that meets these requirements.

On June 29, 2018, the EPA proposed [83 Fed. Reg. 31915, July 10, 2018] that the 2016 CSAPR Update [81 Fed. Reg. 74504, October 26, 2016] fully addresses 20 states' interstate pollution transport obligations for the 2008 ozone NAAQS. The proposal relies on EPA's latest data and modeling to assess air quality nonattainment and maintenance for the 2008 ozone NAAQS. This analysis found that there are projected to be no remaining nonattainment or maintenance receptors in the eastern United States by 2023. In accordance with this finding, EPA is proposing to determine that the 20 states covered by this proposal would not need to submit SIPs establishing additional control requirements beyond the 2016 CSAPR Update to address transported ozone and ozone precursors with respect to the 2008 ozone NAAQS. Also, EPA would have no obligation to establish additional control requirements for sources in these states.

Appendix A

4.0 Ozone

4.1 Formation

Ground-level ozone (O_3) is a gas that is not usually emitted directly into the air, but is a secondary pollutant formed by the reaction of oxides of nitrogen (NOx) and volatile organic compounds (VOCs) in the presence of sunlight. Many types of sources emit these precursor pollutants, including power plants and industrial facilities, on-road and off-road motor vehicles, engines, and small sources collectively referred to as area sources. Ozone is predominately a summertime pollutant; however, high ozone concentrations have been observed in cold months when snow on the ground reflects ultraviolet light so it makes a double pass through the atmosphere and provides more energy for the ozone formation reaction. Ozone and ozone precursors (NOx and VOCs) can be transported hundreds of miles.

4.2 Ozone Precursors—NOx and VOCs

The Good Neighbor provision of the CAA "provides both the states and the EPA with the flexibility to develop a remedy targeted at a particular air quality problem, including the flexibility to tailor the remedy to address the particular precursor pollutants and sources that would most effectively address the downwind air quality problem."[1] "In order to address the regional transport

1. Response to December 9, 2013, Clean Air Act Section 176A Petition From Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont, 82 Fed. Reg. 6516, 19 Jan 2017.

of ozone…., the EPA has promulgated four (4) regional interstate transport rules focusing on the reduction of NOx emissions, as the primary meaningful precursor to address regional ozone, from certain sources located in states in the eastern half of the U.S.[2]" The Ozone Transport Assessment Group's (OTAG) Regional and Urban Scale Modeling, and Air Quality Analysis Work Groups concluded, with which EPA agreed, "Regional NOx emissions reductions are effective in producing ozone benefits; the more NOx emissions reduced, the greater the benefit to air quality; and VOC controls are effective in reducing ozone locally and are most advantageous to urban nonattainment areas." The EPA concluded, "a regional strategy focusing on NOx reductions across a broad portion of the region will help mitigate the ozone problem in many areas of the East" [82 Fed. Reg. 6517, 19 Jan 2017].

4.3 EPA's Designation Process

On October 1, 2015, the EPA revised both the primary and secondary NAAQS for ozone to a level of 0.070 ppm; annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years [80 Fed. Reg. 65292, 26 Oct. 2015]. On November 6, 2017, EPA designated approximately 85% of the counties in the United States as attainment/unclassifiable with the 2015 ozone standard based on 2014 -- 2016 design values [82 Fed. Reg. 54232]. EPA completed additional area designations for most of the remaining portions of the United States in accordance with the requirements of CAA section 107(d) on April 30, 2018, [83 Fed. Reg. 25825] and designated eight counties in

2. Ibid

the San Antonio area on July 25, 2018 [83 Fed. Reg. 35136]. All counties in Oklahoma were designated "unclassifiable/attainment" for the 2015 8-hour ozone NAAQS [82 Fed. Reg. 54232 and 83 Fed. Reg. 25825].

4.4 Transport Modeling

4.4.a. EPA

EPA has provided air quality modeling using a 2011-base platform to help states address the requirements of CAA section 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS. This modeling was provided in its *Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard* [82 Fed. Reg. 1733, 6 Jan. 2017].

4.4.b. Texas Commission on Environmental Quality (TCEQ)

TCEQ has developed modeling specifically to address the 2015 ozone standard Good Neighbor SIP requirements. The modeling results and reports can be found at http://www.deq.state.ok.us/aqdnew/rulesandplanning/o3isip2015/17039SIP_2015OzoneTransport_ado_backup.pdf.

One major way the TCEQ modeling differs from the EPA modeling is that TCEQ uses a 2012 base year instead of a 2011 base year. DEQ and TCEQ have both submitted comments on the unsuitability of meteorological data from the May through September 2011 episode for ozone modeling in response to several EPA ozone model updates. DEQ specifically submitted comments in response

to the *Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard* [82 Fed. Reg. 1733, 6 Jan. 2017]. Evidence supporting the fact that 2011 was a meteorologically anomalous year for Oklahoma and Texas is found in Attachment A of the October Memorandum from Peter Tsirigotis, EPA OAQPS, to Regional Air Division Directors, Regions 1-10, entitled *Considerations for Identifying Maintenance Receptors for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submission for the 2015 Ozone National Ambient Air Quality Standards* ("Tsirigotis October 2018 Memo"). 2011 was the hottest year on record, and the single-worst drought year recorded in Texas since 1895. In Oklahoma, the 2011 ozone season was the warmest on record, with the five-month period from May to September showing a positive temperature departure from the 20th century mean of 5.3 °F, and was the third driest period on record.

4.5 New Information and Analytical Approaches

On March 27, 2018, EPA issued a Memorandum from Peter Tsirigotis, EPA OAQPS, to Regional Air Division Directors, Regions 1-10, entitled *Information on the Interstate Transport State Implementation Plan Submission for the 2015 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I)* ("Tsirigotis March 2018 Memo"). The Tsirigotis March 2018 Memo provided newly-available contribution modeling results, which are still based on the year 2011, along with a list of potential flexibilities in analytical approaches for developing good neighbor SIPs for the

2015 Ozone NAAQS.

Since EPA developed CSAPR, the original rule and subsequent update were based on EPA's modeling that used a screening threshold of one percent (1%) of the NAAQS to identify contributing upwind states warranting further review and analysis. EPA has acknowledged this threshold represents a policy choice, rather than a health-based threshold grounded in risk assessment. In essence, this threshold represents a compromise that allowed the responsibilities for upwind reductions to be spread over a sufficiently-large number of states so that no state would be unduly burdened (individually) with requirements for NOx reductions. Further, in the 2015 transport NODA,[3] the EPA acknowledged that a contribution of 1% of the NAAQS from an upwind state alone does not determine whether the upwind state significantly contributes to nonattainment or interferes with maintenance of a NAAQS to a downwind state. The 1% threshold represents a screening level and the magnitude of the reductions required were determined by a cost-effectiveness analysis with modeling performed to confirm that the cost-effective reductions would have the desired result (attainment of the ozone NAAQS in all but a handful of downwind monitoring sites). It is entirely possible that estimated emissions reductions resulting from emission controls selected based on the cost-effectiveness analysis would be greater than that required to bring an upwind state below the 1% significance threshold and it is also possible that, after achieving the

3. Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard (NAAQS), 82 Fed. Reg. 1740 (January 6, 2017).

cost-effective reductions, a state's contributions could remain above the threshold. For the original CSAPR and 2016 CSAPR Update, the 1% threshold represented an effective policy choice that balanced the need to achieve reductions with cost and distributional concerns. This approach was especially well-suited to these rules, because the targeted sector (fossil-fueled Electricity Generating Units—EGUs) represented an especially target-rich environment for cost-effective NOx emission reductions at that time. Many facilities (older coal-fired boilers, natural gas-fired turbines, etc.) were decades old and had not been equipped with simple, cost-effective technologies like low-NOx burners. In addition, the distribution of NOx allowances tipped the economic calculus in favor of dispatching newer, less-polluting units (e.g., combined-cycle turbines with selective catalytic reduction). Because the electric market is regional, it made sense to bring in a larger pool of upwind states to participate in the program to mitigate the possibility that power generation would switch to states left out of the program, yielding increased NOx emissions from nonparticipating facilities that would negate the reductions achieved by participating states.

DEQ concurs with this approach for the original CSAPR and 2016 CSAPR Update, but DEQ believes that transport issues that need to be addressed in response to the adoption of the 2015 ozone NAAQS are more granular and would benefit from a more focused approach. The possibility of using a different significance threshold was one of the areas of flexibility addressed in the Tsirigotis March 2018 Memo[4], and later in his August 2018

4. Memorandum from Peter Tsirigotis, EPA OAQPS, to EPA Regional Air Division Directors, Regions 1-10, "Guidance on Significant Impact Levels for Ozone and Fine Particles in the

Memo[5]. For the 2015 ozone NAAQS, DEQ believes that 1.0 ppb would be a more appropriate significant impact level for ozone transport. If EPA recommends a Significant Impact Level (SIL) for ozone of 1.0 ppb for Prevention of Significant Deterioration (PSD) determinations,[6] then the significant impact level for ozone transport should be at least 1.0 ppb. It is illogical to allow a new single source to have a higher impact before requiring additional controls than what is required for an entire state. DEQ believes this is especially relevant for this transport evaluation, because the previous rulemakings have harvested most of the low-hanging fruit represented by available controls on EGUs, most of which were already equipped with continuous emissions monitoring systems (CEMS) and whose emissions were already reported to the Clean Air Markets Division (CAMD). Attainment of the 2015 ozone NAAQS will likely require more targeted reductions on smaller sources and enhanced compliance verification on facilities already covered by New Source Performance Standards (NSPS). For example, states with recalcitrant ozone attainment problems which are experiencing a boom in oil and gas development would do well to address control of NOx and VOC emissions in

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Prevention of Significant Deterioration Permitting Program," April 17, 2018.

5. Memorandum from Peter Tsirigotis, EPA OAQPS, to EPA Regional Division Directors, Regions 1-10, "Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards," August 31, 2018

6. Also from the April 17, 2018 Tsirigotis memo.

counties not currently classified nonattainment. These efforts require a more granular approach, including the adoption of presumptive best available control technologies (BACT) for new installations. With additional focus on New Source Review (NSR), it is important to use a similar metric to evaluate potential impacts. Adoption of a 1.0 ppb significance threshold to assess interstate transport would represent a step toward achieving that goal.

4.6 Ozone Transport Assessment for Good Neighbor SIPs 4-step framework

EPA developed a 4-step framework for addressing the requirements of the "Good Neighbor" provision in the CSAPR for the 1997 ozone NAAQS and the 1997 and 2006 $PM_{2.5}$ (particulate matter less than 2.5 microns) NAAQS:

(1) identify downwind receptors that are expected to have problems attaining or maintaining the NAAS;

(2) determine which upwind states significantly contribute (or are "linked") to the downwind air quality problems;

(3) for states that are "linked," quantify the level of upwind emissions that need to be addressed to satisfy the "Good Neighbor" provision; and,

(4) adoption of permanent and enforceable emission reductions in "linked" upwind states.

EPA has used this 4-step process for each successive ozone standard.

4.7 EPA Modeling Data

DEQ utilized the data provided by EPA[7] to perform step one and two above for Oklahoma. We eliminated all sites that had an Oklahoma contribution of less than 0.70 ppb, then eliminated all of the sites that did not have a 2023 average DV, or 2023 maximum DV greater than 70.9 ppb. The result was the six sites listed below:

Site ID	County	State	2023en[8] Average
260050003	Allegan	MI	69.0
481210034	Denton	TX	69.7
484392003	Tarrant	TX	72.5
480391004	Brazoria	TX	74.0
550790085	Milwaukee	WI	71.2
551170006	Sheboygan	WI	72.8

2023en Maximum	Oklahoma Contribution
71.7	1.31
72.0	1.23

7. The data EPA obtained from its modeling for the 2015 ozone transport, is located at https://www.epa.gov/sites/production/files/2018-05/updated_2023_modeling_dvs_collective_contributions.xlsx

8. Note, 2023en is the scenario name for the updated EPA modeling.

74.8	1.71
74.9	0.90
73.0	0.76
75.1	0.95

Next, the flexibility EPA has allowed—a modified step 2, using a Significant Impact Level of 1.0 ppb—would eliminate three sites from consideration, and leave only the three sites listed below that need further review and analysis of any Significant Impacts from Oklahoma emissions:

Site ID	County	State	2023en Average
260050003	Allegan	MI	69.0
481210034	Denton	TX	69.7
484392003	Tarrant	TX	72.5

2023en Maximum	Oklahoma Contribution
71.7	1.31
72.0	1.23
74.8	1.71

To address its responsibilities for the interstate transport of ozone, TCEQ performed ozone modeling using a 2012 base year. The TCEQ future year modeling used growth and control factors based on projected growth in the demand for goods and services, along with the reduction

in emissions expected from state, local, and federal control programs. This modeling data can be found at: http://www.deq.state.ok.us/aqdnew/rulesandplanning/o3isip2015/texas_ot_2023_dvf_with_state_contributions.xlsx. In this spreadsheet, note that the 2023 design value for Denton County TX (481210034) is 68 ppb, and Tarrant County TX (484392003) is 66 ppb. The modeling performed by Texas demonstrates that both of these sites are in attainment in the year 2023, and therefore there is no need to assess the impact of interstate transport on these sites.

In the TCEQ modeling, Texas used an alternative method for developing Maintenance DVs, using annual 4th high values for years 2012 through 2014. The 2012 through 2014 DVs for the Denton and Tarrant county monitoring sites are 81 and 77.7 ppb respectively. Using the EPA method of the highest DV of the three DVs surrounding the base year, the DVs for Denton and Tarrant County monitoring sites are both 87 ppb. Applying the Relative Reduction Factors (RRF) of 0.813 and 0.803 respectively, the 2023 DVs for these sites are 65.9 and 62.4 for the Texas method, and 70.7 and 69.9 for the EPA method. Although Texas's modeling shows a greater reduction, both sites demonstrate attainment in 2023 using either EPA's or Texas's method.

The TCEQ "Transport Demonstration for Ozone" assesses the impacts of anthropogenic emission sources that are the largest contributors of NOx in the 10-county

Dallas-Fort Worth ozone nonattainment area.[9]9 Figure 2-5 of the TCEQ SIP shows that mobile sources represent the largest source category (67,595 tons in 2014 out of 125,981 tons total). However, anthropogenic NOx contributions regionally, and mobile sources in particular, have decreased significantly since 2005 (where mobile NOx sources contributed 138,704 tons and anthropogenic sources totaled 232,311 tons). The mobile source fleet turnover in the Dallas-Ft Worth area is responsible for approximately a 1 ppb per year reduction in ozone. These trends are expected to continue as newer vehicles continue to replace existing vehicles over the next 5 years. Extrapolating from recent trends, it is expected that the Denton and Tarrant sites will be in attainment by 2023.

Data relating to the remaining site to examine, Allegan County Michigan, is listed below.

Site ID	County & State	2023en Average	2023en Maximum
260050003	Allegan, MI	69.0	71.7

Oklahoma Contribution	International Contribution	Initial & Boundary
1.31	0.54	11.85

The 2023en Average value is below 71 ppb, which means this site is assumed to demonstrate attainment by 2023.

9. The link to the TCEQ Transport SIP was provided on page 6 of this document.

Since the 2023en Maximum is above 71 ppb, it is assumed to be a maintenance area in 2023. The DV for the Allegan site has had a substantial reduction in the last 6 years from 84 ppb in 2012 to 73 ppb in 2017, a 1.8 ppb per year decrease. The Allegan county site is substantially influenced by mobile sources from the Chicago area, and like the DFW area, these emissions are expected to be greatly reduced in the near future, by roughly a 1 ppb per year decrease, leading to Attainment for the Allegan site.

A flexibility provided by EPA in the Tsirigotis March 2018 Memo was to determine a state's share of the ozone in excess of the standard for the downwind monitor to determine the amount of ozone reduction they are modelled to be responsible for. In the EPA modelling, the sum of contributions from all upwind states to the Allegan site is 42.90 ppb, and the Oklahoma contribution is 1.31 ppb, which is 3%. We believe that our weight-of-evidence approach (below) is sufficient to demonstrate trends that will bring the Allegan County site into attainment by 2023. However, even if that analysis was rejected, the relatively small contribution from Oklahoma (3% of total upwind state contributions) combined with the distance between Oklahoma sources and the receptor, warrants a focus on nearby states with greater proportional contributions as the most prudent approach to addressing interstate transport of ozone precursors.

5.0 Weight of evidence

Due to the emission reductions required by rules like CSAPR, the 2016 CSAPR Update, and the regional haze

requirements, the NOx emissions from electric generation in Oklahoma has dropped significantly during the ozone season in the last seven years. Oklahoma EGU Acid Rain Ozone Season Emissions are listed below:

Oklahoma EGU Acid Rain Ozone Season Emissions	
Year	**NOx Emissions TPY**
2011	38,285
2012	31,242
2013	23,462
2014	16,230
2015	12,997
2016	12,163
2017	10,435

The Southwest Power Pool (SPP) footprint changed in 2015 from part or all of 8 mostly central and southern states to 13 states, including Montana, North and South Dakota, and Wyoming. The SPP runs a day-ahead market to provide the lowest cost electricity possible. This means that in the summertime when the southern states are in need of additional generation, the northern states can supply it, reducing emissions in the southern states on high electric demand days.

Electric generation in the state of Oklahoma in the last 8 years has been very dynamic, with the changes in the SPP,

building of additional windfarms, and electric utilities installing solar generation facilities having all led to NOx reductions for the state.

The low-cost emission reductions have been obtained from the electric generation sector, and any additional reductions would require more costly emission controls.

Due to time and resource constraints, the modelling EPA performed for the states to use for Good Neighbor SIPs, used a 2011 base year (performing a 12 year projection to 2023), and therefore the Maintenance Monitor calculations were based on the Maximum design value for years 2009 through 2013. The value for the Allegan County monitor was 86 ppb (4 ppb higher than any other Michigan monitor). If the modelling were performed using a 2016 base year (performing a 7 year projection), the Maintenance monitor design value would have been 75 ppb. Assuming a constant rate of reduction, 86 ppb minus 71.7 ppb (future year modelled value) equals a 14.3 ppb difference. 14.3 divided by 12 (years) equals a 1.1917 ppb reduction per year from EPA's modeling. Applying the 1.1917 ppb per year reduction to the 2016 Allegan County Maximum design value of 75 ppb, results in a 66.66 ppb Design Value in the seventh year (2023) , easily demonstrating attainment.

Oklahoma anthropogenic NOx and VOC data provided as supporting data for the previously mentioned Tsirigotis October 2018 Memo demonstrate a substantial reduction of NOx and VOC from 2011 to 2023. The reductions for NOx are from 405,000 to 235,000 tpy and VOC are from 414,000 to 295,000 tpy. These reductions should result in

considerable ozone reductions.

6.0 Conclusions

DEQ has control measures in place to address ozone precursor emissions and these measures have resulted in significant decreases in 8-hour ozone design values in Oklahoma. The average reduction in 8-hour ozone design values for the State of Oklahoma monitoring sites is 0.79 ppb per year for the last 15 years (2004 -- 2017). Additional NOx controls would not be cost effective.

Also, DEQ has a robust, SIP-approved NSR permitting program and therefore has met the CAA infrastructure requirements relating to PSD. The DEQ has also determined that Oklahoma meets the visibility transport provisions for the 2015 ozone NAAQS, as the state is not contributing significantly to nonattainment or maintenance issues in any other state.

In conclusion, this SIP revision demonstrates that Oklahoma meets the interstate transport requirements of CAA section 110(a)(2)(D)(i)(I) as well as the requirements of section 110(a)(2)(D)(i)(II) for PSD and visibility protection, and the interstate pollution abatement and international air pollution requirements of section 110(a)(2)(D)(ii) without further reductions.

Appendix A

Summary of Comments and Responses

Oklahoma's I-SIP Submittal for the Oklahoma Demonstration of Compliance with the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 Ozone National Ambient Air Quality Standard

DEQ received no request for a public hearing during the notice period, therefore, as stated in the public notice, a hearing was not held. One set of comments was received on September 17, 2018 from Guy Donaldson, Associate Director for Air, Multimedia Division, EPA Region 6. EPA's comments were limited to the "Good Neighbor" transport portion of the SIP submittal and all page numbers below are references thereof.

1. COMMENT:

Section 4.5 New Information and Analytical Approaches

EPA suggests factoring in information from the EPA memo of August 31, 2018, "Analysis of Contribution Thresholds for use in Clean Air Act Section 110(a)(2)(D)(i)(I)Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards."

RESPONSE: We have added a reference to the memo on page 9.

2. COMMENT:

Section 4.7 EPA Modeling Data

EPA suggests an evaluation of the collective contribution in the Dallas/Ft. Worth (DFW) and Allegan, Michigan areas. Also, EPA is interested in Oklahoma's recommendations on whether different contribution thresholds are appropriate based on regional differences in the nature or extent of the transport problem.

RESPONSE: The first sentence of this comment is addressed on pages 12 and 13. As for the second sentence in this comment, Oklahoma as not analyzed the regional differences in the nature or extent of the transport problem, so for now, we have no recommendation on whether different contribution thresholds are appropriate.

3. COMMENT:

Section 4.7 EPA Modeling Data

It would be helpful to add additional discussion about the differences between the EPA and TCEQ's modeling results and why the two modeling approaches reach different conclusions regarding whether monitors in DFW will be in attainment in 2023 and whether the DFW area monitors should be considered maintenance receptors. This discussion should also include evaluation of the difference

between the EPA and TCEQ's maintenance receptor methodology calculations and the ozone conduciveness of the 2011 vs. 2012 period.

RESPONSE: Most of page 12, and the first paragraph of page 13 was added to address these comments.

4. COMMENT:

Section 4.7 EPA Modeling Data

As weight of evidence in support of Oklahoma's conclusion that the DFW monitors will be in attainment and should not be considered maintenance receptors, EPA also suggests evaluation of recent ozone levels coupled with monitoring trends and modeling analyses for the DFW area. When considering recent monitoring data, please assess whether the recent period was conducive to ozone formation. The TCEQ monitoring analyses indicate that DFW 8-hour ozone monitoring values have been dropping at a rate of over 1 ppb/year largely due to mobile fleet turnover which is also supported by past TCEQ modeling for future years 2017 and 2018. Much of this information can be found in recent TCEQ Attainment Demonstration SIP submittal materials for the DFW area, which also include conceptual model and analyses of high ozone events in DFW.

RESPONSE: We provide a link to the Texas Good Neighbor SIP data and documents on page 6. We address the annual decrease in ozone on page 12.

5. COMMENT:

Section 4.7 EPA Modeling Data

EPA notes the TCEQ modeling which Oklahoma is relying upon for its SIP has Allegan projected to be a nonattainment receptor in 2023 and the EPA's modeling has Allegan projected to be a maintenance receptor. Oklahoma may want to consider recent DV trends at Allegan (2015-2017 is 73 ppb) and any information on ozone formation and DV trends due to fleet turnover, etc. that could support a conclusion that the Allegan monitor will be in attainment in 2023 and should not be considered a maintenance receptor.

RESPONSE: We address this on pages 12 and 13.

6. COMMENT:

Section 4.7 EPA Modeling Data

Regarding international contributions, EPA suggests that a conclusion that the monitor will not have attainment or maintenance issues in 2023 will require a more fulsome discussion with respect to the relative contributions of anthropogenic international emissions and upwind domestic anthropogenic emissions, and such discussion should address why it is technically and legally supportable to "subtract 100%" of anthropogenic and non-anthropogenic contributions from Canada and Mexico as well as 2%

of the initial and boundary contribution.

RESPONSE: On page 12 we used other arguments to substantiate our case that the Allegan county site will gain attainment by 2023.

7. COMMENT:

Section 4.7 EPA Modeling Data

The proposed SIP revision indicates that reductions of nitrogen oxide emissions from Oklahoma electric generators to comply with the 2016 Cross-State Air Pollution Rule Update should be enough to address any Oklahoma obligation to reduce emissions that interfere with maintenance of the 2015 ozone NAAQS at the Allegan receptor. The EPA did estimate these CSAPR emission reductions and take them into account in the 2023 EPA modeling. If there are additional reductions in NOx and/or VOC emissions at Oklahoma EGUs or other industry sectors that have not been included in the EPA's 2023 modeling, please provide details on the sources and reason for additional reductions, amount of additional reduction, some relative comparison to total emissions for their industry sector(s) in Oklahoma and how these additional reductions might meet any transport obligations. EPA understands that Oklahoma's EGU sector may have recently switched to a market based dispatch system and it may help to explore if this will result in changes in NOx emissions in the future compared to the EPA's projections.

RESPONSE: These comments are addressed on page 14.

8. **COMMENT:**

Section 4.7 EPA Modeling Data

Finally, EPA notes that the EPA's analysis does indicate impacts from Oklahoma emissions on DFW and Allegan monitors. Because of these potential impacts, Oklahoma may wish to consider proceeding to step 3 of the transport framework and considering whether there are reasonable controls that might be implemented to assure the state meets the Clean Air Act's transport requirements.

RESPONSE: Oklahoma believes that the 2016 CSAPR Update is the only reasonable control warranted based on Oklahoma's limited contributions to the DFW and Allegan County monitors.

APPENDIX B — EXCERPTS FROM UTAH STATE IMPLEMENTATION PLAN: 2008 OZONE IT AND 2015 OZONE ISIP (EPA-R08-OAR-2022-0315-0007), DATED JANUARY 24, 2020

STATE OF UTAH
OFFICE OF THE GOVERNOR
SALT LAKE CITY, UTAH
84114-2220

GARY R. HERBERT
GOVERNOR

SPENCER J. COX
LIEUTENANT GOVERNOR

January 24, 2020

Gregory Sopkin, Regional Administrator
US EPA Region 8
1595 Wynkoop Street
Denver, Colorado 80202-1129

Dear Mr. Sopkin,

On January 31, 2013, to meet the Clean Air Act (CAA) 2008 ozone National Ambient Air Quality Standard (NAAQS), the State of Utah submitted *State of Utah 110(a)(2) SIP Infrastructure Elements for Ozone* to the Environmental Protection Agency (EPA) for its approval. Based on EPA Assistant Administrator Gina McCarthy's memorandum titled *Next Steps for Pending Redesignation Requests and State Implementation Plan Actions Affected by the Recent Court Decision Vacating the 2011 Cross-State Air Pollution Rule* issued on November 19, 2012, the Division of Air Quality did not address the good neighbor obligation of Section 110(a)(2)

(D)(i)(I), commonly referred to as Prong 2, in its January 2013 submission. On April 29, 2014, the U.S. Supreme Court reversed a D.C. Circuit decision, holding that the CAA clearly requires that States address Prong 2 of the CAA within three years of any new or revised NAAQS promulgation. In response, the EPA issued a memorandum entitled *Information on the Interstate Transport "Good Neighbor" Provision/or the 2008 Ozone National Ambient Air Quality Standard (NAAQS) under Clean Air Act (CAA) Section 1100(a)(2)(D)(i)* in January of 2015.

On December 22, 2015, Utah submitted a supplement to address CAA Section 110(a)(2)(D)(i)(I) with respect to the 2008 ozone NAAQS. Utah's submittal was disapproved on October 19, 2016, by the EPA with reasoning found at 81 FR 71991. To satisfy the requirements identified in both the EPA's January 2015 memorandum and 81 FR 71991, the DAQ has prepared a document enclosed for your approval titled *State of Utah 110(a)(2) SIP Infrastructure Elements for Ozone.*

On December 28, 2015, the EPA promulgated a new eight-hour concentration NAAQS for ozone. As a result, the Division of Air Quality is required to submit an Infrastructure State Implementation Plan (ISIP) to demonstrate that Utah can implement, maintain, and enforce the new standard. The CAA requires states to submit ISIPs with specific elements outlined in Section 110(a)(2). To meet the requirements outlined in 110(a)(2), the State has prepared a document titled *2015 State Implementation Plan Infrastructure Elements for Ozone* which is also enclosed for your approval.

Appendix B

Supporting documentation for both ISIPs are being submitted by the Utah Division of Air Quality. If you have questions about this request, please call Bryce Bird, Director of the Division of Air Quality, at (801) 536-4064.

Sincerely,

/s/ Gary R. Herbert
Gary R. Herbert
Governor

Enclosures

Appendix B

* * *

SIP Section VIII: Prevention of Significant Deterioration was established as required by the Clean Air Act and applies to all air pollutants regulated under the CAA. SIP Section VIII is codified in R307-110-9 and R307-405, and EPA approved it most recently on July 15, 2011, in 76 FR 41712. On April 14, 2011, Utah DAQ submitted revisions to R307-405 to incorporate the federal Tailoring Rule provisions that were promulgated on June 3, 2010. EPA has not yet acted upon this submittal. Utah amended R307-405 on November 6, 2019, to comply with EPA's January 17, 20127 revisions to Appendix W.

Utah's permitting rules require sources to install best available control technology (BACT) for all pollutants, including ozone precursors.

Section 110(a)(2)(D)(i)(I): Interstate Transport Provisions—Contribution to Nonattainment or Maintenance

Requirement Summary

"Each such plan shall—contain adequate provisions:

(i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the state from emitting any air pollutant in amounts which will—

(I) contribute significantly to nonattainment in, or interfere with maintenance by, any other state with

respect to any such national primary or secondary ambient air quality standard

Utah's Infrastructure

Overview

Utah has authority required to revise its Infrastructure SIP in accordance with CAA 110(a)(2)(H). This SIP revision employs a weight-of-evidence approach to demonstrate that emissions from the State of Utah do not contribute to nonattainment or interfere with maintenance of the 2015 8-hour ozone NAAQS in any other state.

EPA Modeling

The EPA began implementing the Cross-State Air Pollution Rule (CSAPR) on January 1, 2015 to address the interstate transport of nitrogen oxides (NO_x) and sulfur dioxide (SO2) between certain eastern states by imposing limits on NO_X and SO2 produced in those states. Upwind states must control any NOx or SO2 emissions that interfere with a downwind state's agbility to attain or maintain compliance with the NAAQS for PM2.5 and ozone. An upwind state is greater than 1% of the Ozone NAAQS. The EPA finalized the CSAPR Update (Update) on October 26, 2016, which affected 22 eastern states. The Update also defined the western U.S. (or the West) as consisting of 11 states, including Utah. The Update noted that "the EPA is not addressing interstate emission transport in this action for the 11 western contiguous United States" and that "the EPA and western states,

working together, are continuing to evaluate interstate transport obligations on a case-by-case basis."[1]

Following the Update, the EPA issued a Notice of Data Availability (NODA) on January 7, 2017, for preliminary interstate ozone transport modeling data and methods for the 2015 ozone NAAQS.[2] The EPA stated the data was issued to assist states with developing Infrastructure SIPs to address the "good neighbor" requirements of the CAA. The October 2017 NODA provided projected ozone values for the 2023 analytic year and used base-year emissions for 2011. The EPA then issued a memo on March 27, 2018, that provided an update to the contribution modeling in the January NODA.[3] Additionally, the March memo listed potential flexibilities in analytical approaches for developing a good neighbor SIP for each step of the four-step transport framework.

The contribution modeling conducted for the CSAPR used the Comprehensive Air Quality Model with Extensions (CAMx) to run photochemical grid modeling simulations.[4]

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1. Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS. Final Rule. 81 Fed. Reg. 74523

2. 82 Fed. Reg. 1734.

3. Information on the Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards Under Clean Air Act Section 110(a)(2)(D)(i)(I). March 27, 2018.

4. Air Quality Modeling Technical Support Document for the Final Cross State Air Pollution Rule Update, August 2016.

The model used a 2011 modeling platform to project ozone concentrations at individual monitoring sites for the future year 2023. In the CSAPR rulemaking, the EPA established a 1% threshold to determine, for eastern states, whether an upwind state contributes significantly to a downwind state's receptor.[5] The modeling also included contributions from western states and showed that emissions from Utah would contribute more than one percent of the 2015 ozone NAAQS to some monitors in Colorado. However, in the CSAPR Update, the EPA recognized that it was not appropriate to extend CSAPR to western states without first considering important "geographically specific factors." States in the western region thus appropriately continue to use a "weight-of-evidence" approach to demonstrate that air pollution transport is addressed in accord with the Clean Air Act.[6]

Four-step Analysis

In the March 2018 Memorandum, the EPA adapted the CSAPR four-step analysis framework for identifying linkages between states not covered by the CSAPR. The four steps are:

1. Identify downwind air quality problems;

---

5. Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS. Proposed Rule. 80 Fed. Reg. 75714.

6. Partial Approval and Partial Disapproval of Air Quality State Implementation Plans; Arizona; Infrastructure Requirements to Address Interstate Transport for the 2008 Ozone NAAQS. Proposed Rule. 81 Fed. Reg. 15200, 15204.

2. Identify upwind states that contribute enough to those downwind air quality problems to warrant further review and analysis;

3. Identifying the emissions reductions necessary to prevent an identified upwind state from contributing significantly to those downwind air quality problems; and

4. Adopting permanent and enforceable measures needed to achieve those emissions reductions.

Along with newly modeled contributions to downwind receptor sites for the 2015 Ozone NAAQS, the March 2018 memo included a list of potential flexibilities in analytical approaches for developing a good neighbor SIP.

DAQ identified the Denver Metro/North Front Range nonattainment area (Denver NAA) as the only potential area with air quality problems that could potentially be affected by emissions from Utah. EPA's modeling lists five air quality monitors (See Table 1) within the Denver NAA at which Utah contributes greater than 1% of the 2015 Ozone NAAQS. These receptors are discussed in greater detail below.

In the preliminary list of potential flexibilities for step 1, EPA listed consideration of the downwind air quality context, specifically assessing "the current and projected local emission reductions and whether downwind areas have considerd and/or used available mechanisms for regulatory relief." Considering the downwind air quality

context in transport between western states, especially with respect to emission reductions, is necessary because of the nature of interstate transport in the West versus the East. As the California Air Resources Board (CARB) pointed out in its California Tranport Plan, receptors in the West may primarily be impacted by local contributions.[7] Therefore, it is reasonable in step 1 of this assessment to considfer the current and projected emission reductions in the Denver NAA.

Colorado's Air Quality Control Commission recently changed the oil and gas control requirements in Colorado's air quality regulations for compressors, pneumatic pumps, equipment leaks, and fugitive emissions in the Denver NAA.[8] Specific changes include requiring leak detection and repair (LDAR) inspections at some compressor stations, 95% emission reductions at some compressors and pneumatic pumps, changes to inspection frequency, and applicability clarifications. The changes strengthen Colorado's air regulations in the Denver NAA. However, only two of the changes apply statewide: one change that clarifies the definition of "venting" statewide, and the

7. The California Transport Plan states that "[i]n the West, local contributions dominate contributions from other sources by a factor of 8:1. In contrast, what is seen in the East is that local contributions show a much lower impact resulting in a factor of 1:2. This is an indication of a major difference between the contributions that interstate transport makes to the local ozone problem in the two areas of the country." p. D-3.

8. Colorado Air Quality Control Commission's 2017 Revisions to Regulation Number 7—Oil and Gas Emissions Fact Sheet. December 20, 2017.

other that adds new recordkeeping elements in the LDAR provisions of Regulationj Number 7. EPA's HYSPLIT analyses in the accompanhying technical support documenht of Colorado's ozone I-SIP approgal shows that many of the emissions at the violating monitors originate from in-state areas outside of the Denver NAA.[9] Colorado continues to evaluate local methods of control.

The identification of the Denver NAA satisfies step 1 of the four-step process to identify downwind air quality problems. To satisfy step 2, DAQ will use a weight-of-evidence analysis to show that emissions from Utah are not contributing to nonattainment or interfering with maintenance in the Denver NAA.

Weight-of-Evidence Analysis

The EPA recognizes a weight-of-evidence approach as a valid method for western states to use to determine interference. The EPA used a weight-of-evidence approach in its assessment for Arizona's Infrastructure SIP, and approved prong's 1 and 2 of Arizona's 2008 Ozone Infrastructure SIP on May 6, 2016, despite the state's one percent modeled contribution to receptors in California.[10]

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9. COLORADO: Denver Metro/North Front Range Nonattainment Area Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document (TSD). Docket ID: EPA-HQ-OAR-2017-0548-0069.

10. Partial Approval and Partial Disapproval of Air Quality State Implementation Plans; Arizona; Infrastructure Requirements to Address Interstate Transport for the 2008 Ozone NAAQS. Final Rule. 81 Fed. Reg. 31513.

Where Arizona does contribute over one percent of the NAAQS to a projected downwind receptor in California the EPA found, based on the overall weight-of-evidence, that those receptors are not significantly impacted by transported ozone from upwind states.

The EPA has also approved California's transport SIP for the 2008 ozone NAAQS, which uses a weight-of-evidence approach for its demonstration.[11] In the action, EPA found that the plan met the requirements of CAA 110(a)(2)(D)(i)(I) for the 2008 ozone NAAQS because California's emission control program adequately addressed the transport requirement. As part of step two, DAQ will use the weight-of-evidence approach to demonstrate that Utah does not contribute enough to Colorado's nonattainment area to warrant further review and analysis.

Modeled Contributions

According to the modeling in EPA's 2018 Memorandum, DAQ has identified three nonattainment receptor sites and two maintenance receptor sites in Colorado that are within the samje Denver Metro/North Front Range Nonattainment Area. Data from EPA's March 27, 2018 memorandum and updated CSAPR modeling, shown in **Error! Reference source not found.**, identifies the receptors in Colorado where Utah contributes more than 1 percent of the 2015 Ozone NAAQS. The highest contribution at any one receptor site is 1.23 ppb. Therefore,

11. Approval and Promulgation of Air Quality State Implementation Plans; California; Interstate Transport Requirements for Ozone, Fine Particulate Matter, and Sulfur Dioxide. Final Rule. 83 FR 65093

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Utah's analysis below is meant to address both the prong 1 (significant contribution to nonattainment) and prong 2 (interference with maintenance) requirements of section 110(a)(2)(D)(i)(I).

Monitor ID	State	County	2023 Base Case Average Design Value	2023 Base Case Maximum Design Value	UT Modeled Contribution (ppb)
Nonattainment Receptors					
80690011	CO	Larimer	71.2	73	1.05
80350004	CO	Douglas	71.1	73.2	1.08
80590006	CO	Jefferson	71.3	73.7	0.83
Maintenance Receptors					
80050002	CO	Arapahoe	69.3	71.3	1.23
80590011	CO	Jefferson	70.9	73.9	1.04

Table 1: Nonattainment and Maintenance receptors identified in the Updated CSAPR Modeling

In EPA's March 2018 Memorandum they pointed to states whose contributions were greater than one percent of the NAAQS as a threshold for establishing a "link" to a receptor site. In a subsequent memo from EPA dated August 31, 2018[12], they analyzed, and found appropriate,

12. Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards.

the use of different contribution thresholds. In the memo EPA recommended that some states may use a 1.0 ppb threshold for establishing a "link" to a receptor site if the 1 ppb threshold captures a large percentage of the total upwind contribution as compared to a one percent threshold. There are five receptor sites in Colorado, shown in Table 2, where Utah contributes more than 1 percent of the 2015 NAAQS. All five of the sites are within the same Denver NAA. The total upwind contribution across these four sites is 32.29 ppb. When summed across all four receptors a one percent threshold captures 60% of the upwind contribution. A 1 ppb threshold captures 47% of the upwind contribution. Individually, two of the receptor sites capture the same contribution at both one percent and 1 ppb. Because the capture rate at 1 ppb and 1% are comparable, Utah finds that a one ppb threshold is appropriate. Utah is then linked to four of the five receptors in Table 1. Though DAQ uses the 1 ppb threshold for this analysis, it will still evaluate contributions at the fifth receptor to make a more complete assessment of the modeled results.

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Site	State	County	Total Upwind State Contribution (ppb)	Sum of Upwind Contribution Captured with 0.70 ppb (1%) Threshold	Sum of Upwind Contribution Captured with 1 ppb Threshold	Percent of Upwind Contribution Captured using a 0.70 ppb (1%) Threshold	Percent of Upwind Contribution Captured using a 1 ppb Threshold
80050002	CO	Arapahoe	5.98	3.47	3.47	58.00%	58.00%
80350004	CO	Douglas	5.94	3.35	3.35	56.40%	56.40%
80590006	CO	Jefferson	7.06	4.68	2.34	66.30%	33.10%
80590011	CO	Jefferson	6.98	4.51	3.57	64.60%	51.10%
80690011	CO	Larimer	6.33	3.48	2.6	55.00%	41.10%

Table 2: Comparison of contribution thresholds at receptor sites in Colorado

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In EPA's proposed approval of prongs 1 and 2 of Arizona's ozone transport I-SIP for the 2008 ozone NAAQS, it stated that a factor it considers in making a weight-of-evidence determination "is the magnitude of ozone attributable to transport from all upwind states collectively contributing to the air quality problem."[13] EPA considered the total contributions from all states that contributed to the same receptors linked to Arizona, and concluded that upwind state contributions were negligible "particularly when compared to the relatively large contributions from upwind states in the East." EPA's modeling update in March 27, 2018, illustrates this disparity between upwind contributions from states in the East versus the West. For example, the modeling shows that upwind contributions for one site in Connecticut were 44.24 ppb, 12 times as much as the in-state contributions of 3.71 ppb.[14] A site in New York shows upwind contributions (30.68 ppb) are more than double the in-state contributions (13.55 ppb).[15]

13. 81 Fed. Reg. 15203.

14. Site ID 90019003 in Connecticut.

15. Site ID 360810124 in New York.

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Site	State	County	2023 Average DV (ppb)	2023 Maximum DV (ppb)	In-State Contribution (ppb)	Upwind State Contribution (ppb)
80050002	CO	Arapahoe	69.3	71.3	22.94	5.98
80350004	CO	Douglas	71.1	73.2	24.71	5.94
80590006	CO	Jefferson	71.3	73.7	25.52	7.06
80590011	CO	Jefferson	70.9	73.9	24.72	6.98
80690011	CO	Larimer	71.2	73	21.74	6.33

Table 3: Comparison of in-state contributions to upwind state contributions

In the West, however, *in-state* contributions are much more significant, while upwind contributions are much smaller. The highest collective contribution from upwind states to any of the five previously listed receptors in Colorado (Site 80590006) is 7.06 ppb, while in-state contributions for the same receptor are 25.52 ppb. Table 3 shows the same case for the other Colorado sites. Because of the difference in magnitude between Colorado's in-state contributions and Utah's modeled contributions to the five identified receptors, Utah considers its contributions negligible.

Non-Anthropogenic and International Emissions

Consideration of non-anthropogenic and international contributions is identified as a flexibility under Step 3 in EPA's March memo. Attachment C of that memo contains modeled contributions for Canada/Mexico, offshore, fire, biogenic, and initial/boundary conditions. While this flexibility is intended for step 3, it is still worth addressing here to illustrate the magnitude of these emissions compared to those modeled as coming from Utah. Table 4 shows the uncontrollable emissions from Canada/Mexico, Offshore, Fire, and Biogenic emissions and the Initial/Boundary Conditions at each modeled receptor in the Denver NAA comprise over 50 percent of emissions at those sites. Ozone precursors from biogenics alone contribute 4.19 to 5.71 ppb to the Colorado receptors. By comparison, Utah's contribution ranges from 0.83 to 1.23 ppb, or approximately one-quarter the contribution of biogenics.

Site	State	County	2023 Maximum DV (ppb)	Non-U.S./Non Anthropogenic* (ppb)	Initial and Boundary Conditions	Total Uncontrollable Contribution (ppb)	Percent of Maximum DV
80050002	CO	Arapahoe	71.3	5.39	34.84	40.23	56%
80350004	CO	Douglas	73.2	5.53	34.74	40.27	55%
80590006	CO	Jefferson	73.7	7.13	31.41	38.54	52%
80590011	CO	Jefferson	73.9	6.05	32.96	39.01	53%
80690011	CO	Larimer	73	8.42	34.54	42.96	59%

* Includes contributions from Canada/Mexico, Offshore, Fire, and Biogenic sources

Table 4: Contributions from Canada/Mexico, Offshore, Fire, and Biogenic emissions and the Initial/Boundary Conditions to Colorado receptor sites

Considering the degrees to which in-state, non-anthropogenic, and international emissions contribute to each of the previously listed receptors, the DAQ determines that it is unnecessary to consider step 3 in this analysis, which involves identifying the emissions reductions necessary to prevent contributions to downwind air quality problems.

Emissions Reductions from Existing Regulations

EWPA's contribution modeling for interstate ozone transport relied on a 2011 base emission year Since 2011, Utah's emissions have decreased significantly. This decrease in emissions is a result of permitting actions and regulatory requirements. Based on DAQ's statewide inventories Volatile Organic Compounds (VOCs) were reduced by 30% (59,353 tpy) and NO_x was reduced by 37% (88,973 tpy) between 2011 and 2017. While Utah is unable to require controls for mobile sources, it is expected that regulations such as the Tier 3 Vehicle Emissions and Fuel Standards will reduce emissions from these sources nationally. DAQ expects additional reductions beyond 2017 as adopted air quality rules listed below become fully implemented by the sources.

As part of a SIP for the Salt Lake City, UT PM 2.5 Nonattainment area, the Utah Air Quality Board amended numerous area source rules to comply with Best Available Control Technology (BACT) requirements. Three of the rules apply statewide. The rules and their subsequent emissions reductions by 2020 are shown in Table 3. Overall, the emissions reductions from these rules are projected to be 1,440 tons/year of NO_x and 5,624 tons/year of VOCs by 2020.

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Rule Number	Rule Name	Utah Air Quality Board Final Adoption Date	Emissions Reduced in Pounds Per Day (lb/day) by 2020	
			NOx	VOC
R307-208*	Outdoor Wood Boilers	10-Apr-2013	5.8	186
R307-221*	Emission Standard: Emission Controls for Existing Municipal Solid Waste Landfills	8-Feb-2008	0	299.37
R307-230*	NOx Emission Limits for Natural Gas-Fired Water Heaters	3-Aug-2017	1,632.52	0
R307-302	Solid Fuel Burning Devices	1-Feb-2017	1,327.61	10,311.50
R307-303	Commercial Cooking	15-Dec-2015	0	54.29
R307-304 & R307-335	Industrial Solvent Use and Degreasing	6-Dec-2017 & 29-Oct-2017	0	1,527.89
R307-342	Adhesive and Sealants	1-Dec-2014	0	1,533.71

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R307-343	Emissions Standards for Wood Furniture Manufacturing Operations	6-Dec-2017	0	910.88
R307-344	Paper, Film & Foil Coating	6-Dec-2017	0	147.62
R307-345	Fabric & Vinyl Coating	6-Dec-2017	0	442.96
R307-346	Metal Furniture Surface Coating	6-Dec-2017	0	249.51
R307-347	Large Appliance Surface Coating	6-Dec-2017	0	0.69
R307-348	Magnet Wire Coating	6-Dec-2017	0	22.18
R307-349	Flat Wood Panel Coating	6-Dec-2017	0	17.15
R307-350	Miscellaneous Metal Parts & Products Coating	6-Dec-2017	0	411.43
R307-351	Graphic Arts	6-Dec-2017	0	1,062.39
R307-352	Metal Containers, Closure & Coil Coating	6-Dec-2017	0	125
R307-353	Plastic Parts Coating	6-Dec-2017	0	222.41

R307-354	Auto body refinishing	6-Dec-2017	0	1,817.76
R307-355	Control of Emissions from Aerospace Manufacture & Rework Facilities	8-Mar-2018	0	43.13
R307-356	Appliance Pilot Light	1-Jan-2013	4,926.20	361.78
R307-357	Consumer Products	8-May-2014	0	4,625.34
R307-361	Architectural Coatings	31-Oct-2013	0	6,441.84
	Total Emissions Reduced: (lb/day)		**7,892.10**	**30,814.80**

* Rule applies statewide

Table 5: Area source rules approved by the Utah Air Quality Board

On April 28, 2017, the EPA Administrator signed a final action to reclassify the Salt Lake PM2.5 nonattainment area from Moderate to Serious for the 2006 24-hour PM2.5 NAAQS. As required, the Utah Division of Air Quality completed a BACT analysis for point source emissions. Sources that emit 70 tons per year (tpy) or more of PM2.5 or any PM2.5 precursors—nitrogen oxides (NO_x), volatile organic compounds (VOCs), sulfur dioxide (SO_2), and ammonia—were subject to BACT. In addition, sources that met or exceeded the 70 tpy threshold for a single

precursor were reclassified as major sources subject to Title V permit regulations. Under the Serious Area SIP requirements, point sources underwent an updated review of control techniques to ensure all controls met BACT. DAQ identified best available controls to limit emissions of direct PM2.5, NO_x, SO_2 and VOCs, and drafted new permit limits based upon those controls and control techniques.

DAQ identified 26 stationary point sources that met or meet the threshold of 70 tons or more per year for PM2.5 or any precursor. The actual emission limits and operating procedures that reflect the implementation of BACM/ BACT are included Utah's SIP Subsection IX. Part H, 11 & 12, which is made enforceable via incorporation into the Utah Air Quality Rules in R307-110-17. The Utah Air Quality Board adopted this SIP section and rule January 2, 2019.

Eight rules related to oil and gas sources were approved by the Utah Air Quality Board in 2018 and 2019. The purpose of these rules was to increase compliance with existing BACT standards in the State. Under Utah's previous rules, compliance officers were unable to inspect oil and gas sources unless they had a permit. A change to permit-by-rule (PBR) regulations required all oil and gas facilities, regardless of size, to register with the state. Facilities emitting more than five tons of any criteria pollutant must comply with BACT requirements. Some rules, such as R307- 504, are a requirement for all operations. Inspections have increased by 46% since approval of the PBR regulations. Leaks are detected at approximately 70% of the inspected sites. Of the leaks

detected, 95% are repaired within 15 days. The increased inspection and compliance has decreased NO_x and VOC emissions from oil and gas sources. While the rules are not currently incorporated into Utah's SIP, they will be incorported into a SIP and submitted to EPA by spring 2020. The rules, and their effective dates, are shown in Table 5.

Rule Number	Rule Name	Effective Date
R307-504	Tank Truck Loading (amended to add controls for tank truck loading)	March 1, 2109
R307-505	Registration Requirements (new rule)	March 1, 2109
R307-506	Storage Vessel (new rule)	March 1, 2109
R307-507	Dehydrators (new rule)	March 1, 2109
R307-508	VOC Control Devices (new rule)	March 1, 2109
R307-509	Leak Detection and Repair Requirements	March 1, 2109
R307-510	Natural Gas Engine Requirements	March 1, 2109
R307-511	Associated Gas Flaring	March 5, 2109

Appendix B

Table 6: Oil and Gas Sector Rules to reduce NO_x and VOC emissions

Requiring additional emissions reductions under steps three and four of the 4-step analysis framework is not necessary because of emissions reductions already achieved since the 2011 base year and anticipated future reductions.

Assessment

The evidence presented above demonstrates that Utah's interstate transport I-SIP for the 2015 8-hour ozone NAAQS contains provisions that meet the requirements of CAA section 110(a)(2)(D)(i)(I). The combined information contained in this weight-of-evidence analysis shows that emissions from Utah do not contribute to nonattainment or interfere with maintenance of the 2015 8-hour ozone NAAQS in the Denver NAA in Colorado. NO_x and VOC emissions have decreased in Utah since 2011 through a combination of regulatory and permitting actions. The EPA's modeling also shows that contributions from Utah are not significant when considering the total emission contributions from all upwind states and the contributions from within the state of Colorado. These pieces of evidence demonstrate that Utah is neither "linked" nor contributing to the interference of maintenance of the NAAQS in downwind states.

APPENDIX C — COMMENT SUBMITTED BY UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY (EPA-R08-OAR-2022-0315-0011), DATED JULY 25, 2022

STATE OF UTAH

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

KIMBERLY D. SHELLEY
Executive Director

DIVISION OF AIR QUALITY
BRYCE C. BIRD
Director

July 22, 2022 DAQP-065-22

Kathleen Becker, Administrator
U.S. Environmental Protection Agency
EPA Docket Center, OAR,
Docket EPA-R08-OAR-2022-0315
Mail Code 28221T, 1200 Pennsylvania Avenue NW
Washington, DC 20460
[submitted electronically through www.regulations.gov]

Re: Docket ID No. EPA-R08-OAR-2022-0315, Air Plan Disapproval; Utah; Interstate Transport of Air Pollution for the 2015 8-Hour Ozone National Ambient Air Quality Standard

Dear Administrator Becker,

Thank you for considering comments from the Utah Division of Air Quality (UDAQ) regarding the proposed

disapproval of Utah's 2015 ozone standard interstate transport State Implementation Plan (SIP). The UDAQ appreciates the opportunity to provide specific comments on the significant proposed action of disapproving Utah's SIP revision. On June 22, 2022, UDAQ submitted comments on EPA's proposed Federal Implementation Plan (FIP) Addressing Regional Ozone Transport for the 2015 National Ambient Air Quality Standard (NAAQS) (EPA-HQ-OAR-2021-0668).[1] Given the link between these two proposed actions, our comments here are similar in nature. As requested in our comments on the proposed FIP, given the overlapping time periods for public commenting on both actions coupled with the technical complexity of each, Utah requests a 60-day extension to the current comment period, allowing the state until September 23, 2022, to provide further analysis and comments.

The UDAQ disagrees with EPA's disapproval of the SIP for the following reasons. First, through coordination with EPA Region 8, UDAQ developed and submitted what the agency thought to be a fully approvable SIP that met EPA's guidance and requirements at the time. The EPA's change of position at these late stages of the SIP process wastes the state's resources and time devoted to this rulemaking. Second, the proposed disapproval relies heavily on modeling results that were unavailable to the state during the development of the SIP. Third, UDAQ thinks that EPA's proposed rule to disapprove Utah's

1. Comment submitted by Utah Department of Environmental Quality (UDAQ); June 22, 2022. DAQP-055-22, EPA docket ID number EPA-HQ-OAR-2021-0668-0436.

SIP is not rooted in the technically accurate analysis but instead is motivated by the desire to include Utah in the proposed interstate transport FIP. Fourth, UDAQ thinks that the modeling and logic justifying Utah's inclusion in the proposed FIP are flawed. Lastly, we note region-specific challenges in regulating ozone pollution, which underscore a need for stronger cooperation between Utah and EPA.

EPA's Proposed Disapproval Goes Against the Principles of Cooperative Federalism

Prior to this proposed disapproval, UDAQ was successful in implementing the requirements of the Clean Air Act (CAA) by working closely with our co-regulatory partners at EPA's Region 8 office, as envisioned by the principles of cooperative federalism. This close working relationship directly contributed to significant recent achievements including reducing ambient $PM_{2.5}$ concentrations and allowing all three of Utah's $PM_{2.5}$ nonattainment areas to reach attainment by the attainment date for the current NAAQS. As the state regulatory agency, UDAQ understands the nuances of our airsheds and the people's priorities, and can create state implementation plans that are best for Utah. The benefit of cooperative federalism is having the autonomy to do what's best for the state, but do so in partnership with EPA to ensure that the CAA intent and requirements are met.

In this same spirit, UDAQ engaged early and often with our counterparts at Region 8 in the development of our interstate transport SIP. Through this collaboration and

EPA's guidance[2], Utah selected the alternative threshold of 1 ppb. As noted in the guidance, the use of an alternative threshold provides greater flexibility to states while SIPs are developed.[3] Specifically, the guidance states that "a threshold of 1 ppb may be appropriate for states to use to develop SIP revisions addressing the good neighbor provision for the 2015 ozone NAAQS", since "the amount of upwind collective contribution captured with the 1 percent and 1 ppb threshold is generally comparable overall."[4] Thus, UDAQ was surprised when EPA proposed to include Utah in the proposed FIP, and subsequently disapproved the state's SIP based in large part on the selection of the 1 ppb over the 1% of the NAAQS threshold. If the 1 ppb threshold was in fact inappropriate for the development of this SIP, EPA should have communicated that view to UDAQ during the early engagement and development process or during the state's public comment period. Additionally, EPA released no new guidance directing states to use a 1% threshold either prior to or after SIP submittal deadlines.

The EPA's decision to change the acceptable criteria *after* the development and submission of SIPs, and to do so with no additional guidance, puts states in the difficult

2. Memorandum: *Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards* (Contribution Thresholds Memo). August 31, 2018.

3. *See id.* at 2.

4. *Id.* at 4.

position of trying to plan with a moving set of criteria. This whipsaw approach inevitably results in wasted state time and resources. It has become apparent to UDAQ that working closely with our EPA region has no bearing on the outcome of some of EPA's final regulatory actions and is inconsistent with principles of cooperative federalism. As mentioned in Utah's FIP comments, UDAQ respectfully requests EPA to consider ways to align its agency more efficiently so that the policy priorities of the current administration better align with the implementation and timing of CAA requirements at the regional and state level.

EPA's Proposed Disapproval Relies on the Modeling Results That Were Unavailable During the SIP Development

The EPA indicates that its proposed decision to disapprove Utah's SIP relies heavily on using the updated modeling platform 2016v2. The EPA explains that "by using the updated modeling results, the EPA is using the most current and technically appropriate information for this proposed rulemaking."[5] However, as EPA knows, these results were not available to the states during the development and submittal of the interstate transport SIPs. Because SIP planning is a lengthy process, it is unacceptable for EPA to use modeling results for their rulemaking that were developed after state SIP preparation. As with all planning, SIP revisions are a representation of the best available data and modeling

5. 87 Fed. Reg. 31,470, 31,472 (May 24, 2022).

at that time. Using results from a modeling effort that post-dated the states' SIP development period is an additional example of EPA changing expectations without issuing appropriate and timely guidance. By relying on modeling results not available during the time of state SIP development, EPA is setting a precedent that creates significant uncertainty for any planning effort, further eroding the trust required for effective state and federal cooperation. This is clearly inconsistent with the cooperative federalism structure of the CAA.

EPA's Proposed Disapproval is Motivated by the Desire to Include Utah in the FIP

Upon review, UDAQ finds the timing and sequence of the proposed actions in question to be highly irregular compared to a traditional rulemaking process. The fact that EPA proposed to include Utah in the broad and highly impactful FIP prior to issuing proposed disapproval of the state's SIP is unusual. This may suggest that EPA's proposed SIP disapproval aims to regulate a select set of point sources by including Utah in the proposed FIP.

EPA's Inclusion of Utah in the FIP Relies on Flawed Logic

As noted above and outlined in our comments related to the proposed FIP, UDAQ believes that the proposed disapproval of Utah's SIP is an effort to fulfill an agenda outside of the original intent of the interstate transport provisions of the CAA. Specifically, the intent is to force Utah's inclusion in the FIP to target emission reductions

from fossil fuel-fired electric generating units (EGUs) located in the state. The UDAQ has provided extensive comments on the substantial limitations and problems with the modeling used to justify the inclusion of Utah in the proposed FIP. These limitations are significant and include inappropriate modeling resolution, inadequate modeling of atmospheric transport, significant negative modeling bias, and a likely misrepresentation of the atmospheric chemical regime as a result of issues with the inventories used.

Beyond these limitations, EPA concedes that the estimates for air quality impacts for emission sources were conducted using an inferior method, in direct conflict with EPA's own modeling guidance. As EPA states in its own technical support document, "Air quality modeling would be the optimal way to estimate the air quality impacts at each cost threshold level from EGUs and non-EGUs emissions reductions. However, due to time and resource limitations EPA was unable to use photochemical air quality modeling for all but a few emissions scenarios. Therefore, in order to estimate the air quality impacts for the various levels of emission reductions and to ensure that each step of its analysis is informed by the evolving emissions data, EPA used a simplified air quality assessment tool (AQAT)."[6] Given that the modeling used as the justification for the inclusion of Utah in the proposed FIP is not technically

6. Technical Support Document (TSD) for the proposed Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard. Ozone Transport Policy Analysis. Docket ID No. EPA-HQ-OAR-2021-0668.

sound, EPA should have not included Utah in the FIP and proposed to approve the state's SIP instead.

Regionally-Specific Ozone Challenges

The UDAQ would also like to note the exceptional challenges of reducing ozone in the Western United States. States in the West face significant and regionally-specific challenges in meeting ozone standards including elevated natural background ozone levels,[7] increasing instances of wildfire,[8] significant biogenic contributions,[9] as well as the influence of internationally transported pollutants.[10] Beyond these regionally-specific challenges, a significant portion of the emissions of Oxides of Nitrogen (NOx) in Utah comes from mobile sources, an area over which the State has limited regulatory authority. These combined regionally-specific challenges paired with the fact that a substantial portion of emissions is under federal

7. Scientific Assessment of background ozone over the U.S.: Implications for air quality management

8. Buchholz, R.R., Park, M., Worden, H.M. et al. New seasonal pattern of pollution emerges from changing North American wildfires. Nature Communications 13, 2043 (2022). https://doi.org/10.1038/s41467-022-29623-8

9. EPA Webinar; Description and preliminary evaluation of BELD 6 and BEIS 4. ORD. Jesse O. Bash and Jeff Vukovich

10. Entrainment of stratospheric air and Asian pollution by the convective boundary layer in the southwestern U.S.; Langford, A.O. et al. (2017), J. Geophysics. Res. Atmos., 122, 1312-1337, doi:10.1002/2016JD025987

jurisdiction make successful ozone reductions exceedingly challenging, furthering the need for strong cooperative federalism and active collaboration between our respective agencies. The actions proposed by the EPA to deny our SIP to fulfill a specific agenda undermine the trust required for successful cooperative federalism, which only serves to further complicate the shared goals of reducing ozone concentrations and protecting public health.

Conclusion

For the reasons outlined in these comments, as well as those submitted in opposition to the proposed FIP, EPA is acting in error when proposing the disapproval of the SIP and UDAQ requests that EPA reconsider this action. In direct collaboration with Region 8, and using the best available modeling results and guidance available at the time, Utah developed and submitted a fully approvable SIP. By relying on data and modeling results not available to the states at the time of the SIP planning, and by changing the acceptable thresholds without issuing guidance in a timely manner, EPA is setting the wrong precedent. It is the precedent of changing the acceptance criteria for a SIP after the plans have been submitted in an effort to fulfill an agenda not aligned with the original intent of the interstate transport provisions of the CAA. The UDAQ is committed to the development and enforcement of SIPs that meet all of the CAA requirements based on the best available data and guidance and is committed to doing so in the spirit of cooperative federalism with our federal partners. However, the actions proposed in this

disapproval actively work to erode the trust, built over years of cooperation, which is required to fulfill these obligations and collaboratively protect public health.

Sincerely,

/s/_____
Bryce C. Bird
Director

APPENDIX D — EXCERPTS FROM COMMENT SUBMITTED BY PACIFICORP (EPA-R08-OAR-2022-0315-0014), DATED JULY 25, 2022

PacifiCorp **1407 W. North Temple, STE 110**
Salt Lake City, UT 8416

July 25, 2022

ATTN: Adam Clark
Air and Radiation Division
EPA, Region 8
Mailcode 8ARD-IO
1595 Wynkoop Street
Denver, Colorado, 80202-1129
telephone number: (303) 312-7104
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Re: PacifiCorp Public Comments on EPA's Proposed Disapproval of Utah's Ozone Transport Ozone SIP; Docket ID No. EPA-R08-OAR-2022-0315

Dear Mr. Clark:

PacifiCorp submits these public comments in opposition to the U.S. Environmental Protection Agency's ("EPA's") proposed disapproval of Utah's State Implementation Plan for the Interstate Transport of Air Pollution for the 2015 8-Hour Ozone National Ambient Air Quality ("Utah Ozone Transport SIP" or "Utah SIP"). EPA's proposed disapproval was published on May 24, 2022, at 87 Federal Register 31,470, in an action entitled "Air Plan Disapproval; Utah; Interstate Transport of Air Pollution for the 2015 8-Hour Ozone National Ambient Air Quality Standards" ("Proposed Disapproval").

PacifiCorp supports reasonable, effective and achievable regulation that complements its ability to deliver affordable electric service safely and reliably to customers and end-users. The Proposed Disapproval does not meet these criteria—in large part because EPA was compelled to take action via a settlement agreement after neglecting to respond to a number of State Implementation Plans ("SIPs") for the interstate transport of ozone under the Clean Air Act's ("CAA") good neighbor provisions. The relevant ozone standard was finalized in 2015, and Utah submitted a plan to address its good neighbor obligations based on information provided by EPA; but EPA took no action on that plan for over 28 months until the Proposed Disapproval. In addition, EPA did not follow the chronology required in the CAA because it first proposed a federal implementation plan ("Proposed FIP" or "FIP") that included Utah before proposing, let alone finalizing, the Utah SIP disapproval necessary to issue the FIP. EPA's delay and flawed process inextricably ties the FIP to this Proposed Disapproval and forecloses any opportunity for Utah to respond with appropriate data or clarifications. After delaying action for so long, imposing the Proposed FIP through the flawed Proposed Disapproval falls short of a reasoned and balanced approach to interstate ozone transport and, instead, creates a one-size-fits-all approach that threatens electric reliability in the western United States.

* * *

reductions are surplus and the control equipment installations are not necessary to meet the CAA requirements. The only remaining nonattainment receptor in 2026 (the NREL receptor) is not significantly impacted by Utah sources. Utah has a 0.90 parts per billion ("ppb") ozone contribution to the NREL receptor in 2026 and, as discussed above, this contribution is not a statistically significant contribution and should not be considered significant. By taking the Colorado reductions and the more appropriate and representative Colorado modeling of the impacted monitors into account, there is further support that Utah does not have a significant impact on these monitors and Utah's SIP should be approved.

EPA should follow its long-standing practice of recognizing home-state emission reductions in determining up-wind state impacts on their air quality monitors. EPA followed that approach in its 2021 Revised CSAPR Update Rule and should do so now.

c. EPA acted contrary to its Threshold Guidance and procedural due process in the Proposed Disapproval.

EPA's Threshold Guidance provided states a pathway to use a 1 ppb threshold for significant impacts on downwind monitors. Utah and almost every other state followed this pathway, but EPA has now changed its mind and rejects the very pathway it opened for all of these states for "policy reasons".[43] Utah relied on the Threshold Guidance

43. *See* 87 FR at 31,478.

to justify using the 1 ppb threshold at Step 2 as a basis to assert that Utah would not be linked to some projected downwind nonattainment or maintenance receptors and that other linkages were not significant given other EPA-suggested considerations.[44] *See* Sub-Section II.d below. In the Proposed Disapproval, EPA insists that only a 1 percent ("%") threshold, or 0.7 ppb, can be used. EPA explains it has moved on from the positions it stated in the August 2018 Threshold Guidance, and EPA ultimately applies the 1%threshold to justify the Proposed Disapproval.[45] EPA should allow use of the 1 ppb threshold.

EPA ignores a significant EPA study supporting use of the 1 ppb threshold. Admittedly, EPA determined the one-percent threshold was appropriate when it first adopted the original CSAPR rule. This was based on 2011 modeling analysis that compared a 5% threshold, a 1% threshold, and 1/2% threshold.[46] Based on this modeling analysis, EPA concluded that the upwind capture rates under the 1% and 1/2% threshold options were similar, indicating that little benefit would be achieved with the lower threshold. EPA did find that raising the threshold

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44. *Id.*

45. *See e.g.* 87 FR at 31,479 (" . . . us[ing] a 1 percent of NAAQS approach ensures that as the NAAQS are revised and made more stringent, an appropriate increase in stringency at Step 2 occurs."); (". . . . These data were examined to determine if Utah contributes at or above the threshold of 1 percent of the 2015 8-hour ozone NAAQS (0.70 ppb) to any downwind nonattainment or maintenance receptor.").

46. 76 FR 48,208, 48,237 (August 8, 2011).

to 5% would leave too many upwind states and emission sources unregulated.

EPA conducted further analysis in 2018 when it issued the Threshold Guidance that re-analyzed the minimum threshold using a tighter range of options and more up-to-date modeling techniques and data.[47] Specifically, EPA evaluated the difference in capture rates between the previous threshold of 0.7 ppb (1%), a threshold of 1 ppb, and a threshold of 2 ppb. Like the 2011 analysis, EPA's 2018 analysis again concluded that the difference between the two lower options—0.7 ppb and 1 ppb—was minimal, while the higher threshold of 2 ppb left too many emissions unregulated. As a result, EPA considered capture rates at the 0.7 ppb and 1 ppb thresholds to be generally comparable, and thus concluded that "it may be reasonable and appropriate for states to use a 1 ppb contribution threshold, as an alternative to a 1 percent threshold," in addressing interstate transport under the CAA good neighbor provision.[48] Notably, a threshold of 1 ppb is just 1.4% of the ozone standard of 70 ppb, and therefore would round down to 1%.

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47. EPA Memorandum, *Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards* (Aug. 31, 2018) ("Threshold Guidance").

48. *Id*. at 4.

Appendix D

i. The fact that EPA's new 1 ppb interpretation runs contrary to 49 states' understanding signals error.

In the Proposed Disapproval EPA states:

> Following receipt and review of 49 good neighbor SIP submittals for the 2015 8-hour ozone NAAQS, the EPA's experience has been that nearly every state that attempted to rely on a 1 ppb threshold did not provide sufficient information and analysis to support a determination that an alternative threshold was reasonable or appropriate for that state.[49]

The fact that nearly every state got it wrong is more an indication that EPA changed course without notice than that the states are unable to read and interpret EPA guidance. While technically retaining the Threshold Guidance, EPA proposes to disapprove numerous state submissions that relied on the guidance, including Utah's SIP, claiming that those states should have somehow done more analysis than EPA required in the memo, and asserting without explanation that consistency is needed across the country. This is an about face for EPA, which clarified in a previous ozone rulemaking that western states should not be treated the same as other areas of the country because the different geography, meteorology, background ozone levels, wildfire impacts and stratospheric ozone events in the West necessitated

49. 87 FR at 31,478.

case-by-case treatment .[50] To justify its about face, EPA now claims that the Threshold Guidance may only be relied on, even for high altitude western states like Utah,

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50. *See*, *e.g.*, *National Ambient Air Quality Standards for Ozone*, 80 FR 65,292, 65,300 (Oct. 26, 2015) ("observational and modeling analyses have concluded that O3 concentrations in some locations in the U.S. on some days can be substantially influenced by sources that cannot be addressed by domestic control measures. In particular, certain high-elevation sites in the western U.S. are impacted by a combination of non-U.S. sources like international transport, or natural sources such as stratospheric O3, and O3 originating from wildfire emissions."); Memorandum from Stephen D. Page, Director, OAQPS, EPA, "Information on Interstate Transport 'Good Neighbor' Provision for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) under Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I)" (January 22, 2014), at 4 (recommending ozone transport in western states should be evaluated on a case-by-case basis); CARB, California Infrastructure State Implementation Plan (SIP) Revision, at 15, January 19, 2016 (finding that in contrast to the East, ozone transport in the West has a much smaller proportion of local emissions and that the larger states and complex terrain in the West make modeling less accurate and helpful); Lin M, Fiore AM, Cooper OR, Horowitz LW, Langford AO, Levy H, et al., "Springtime high surface ozone events over the western United States: quantifying the role of stratospheric intrusions," *J Geophys Res.* 2012; 1 17:D00V22; Lefohn AS, Wernli H, Shadwick D, Oltmans SJ, Shapiro M., Quantifying the importance of stratospheric-tropospheric transport on surface ozone concentrations at high- and low-elevation monitoring sites in the United States. *Atmos Environ.* 2012;62:646-656; Lefohn AS, Wernli H, Shadwick D, Limbach S, Oltmans SJ, Shapiro M., The importance of stratospheric-tropospheric transport in affecting surface ozone concentrations in the western and northern tier of the United States. *Atmos Environ.* 2011;45:4845-4857.

when a state meets its new, unannounced standards by providing "a technically sound assessment of the appropriateness of using this alternative threshold based on the facts and circumstances underlying its application in the particular SIP submission."[51] EPA's new demand for the states to provide a technical analysis to support the use of the 1 ppb threshold identified in the August 2018 Threshold Guidance is inconsistent with EPA's earlier communications with Utah (and other states) and with the stated purpose of the Threshold Guidance, which was to "provide analytical information" and to allow states to use that "information to make recommendations about what thresholds may be appropriate for use" in SIPs.[52] EPA is essentially punishing Utah and almost all other states for using the "recommendation" that EPA made in the Threshold Guidance.

Like so many states, Utah used the 1 ppb threshold in its Interstate Transport Ozone SIP. In fact, EPA commented on Utah's use of the 1 ppb threshold and recommended that it rely on the Threshold Guidance to do so. In EPA's comments on Utah's SIP during the state rulemaking process, EPA instructed: "[g]iven that the draft analysis makes use of the 1 ppb threshold, the EPA recommends the state review the August 31, 2018 Memo and the associated rationale for the use of this threshold."[53] Utah

51. 87 FR at 31,474.

52. August 2018 Threshold Guidance at 1.

53. *See* EPA Preliminary Comments on Utah's Draft 2015 Ozone Infrastructure Submittal, at 2, EPA-R08-OAR-2022-0314-003, *found at* regulations.gov.

did just that, providing analysis in its SIP based on the August 2018 Threshold Guidance and supporting the use of the 1 ppb threshold with data and analysis.[54] Utah and the numerous other states were not acting unreasonably to rely on EPA's Threshold Guidance, particularly when EPA published the Threshold Guidance for that very purpose during the very time states were drafting their SIPs. EPA was aware of Utah's reliance on the Threshold Guidance, and provided direction to Utah supporting its use of the Threshold Guidance.

Despite the fact that the Threshold Guidance was based on the same principles as EPA's 2011 analysis and was improved through use of a tighter range of options and more current data and modeling, EPA now all but disavows it.[55] Moreover, EPA is proposing to disapprove of Utah's use of an alternative 1 ppb threshold in part due to EPA's determination that use of an alternative threshold "may be impractical or otherwise inadvisable for a number of additional policy reasons."[56] Under the appliable requirements of the CAA, changing policy reasons play no part in authorizing EPA to disapprove a SIP.

PacifiCorp asks EPA to reconsider its minimum contribution threshold because EPA has not identified

54. *See* October 23, 2019, State of Utah 119(a)(2) SIP Infrastructure Elements for Ozone, at 7-8, EPA-R08-OAR-2022-0314-007, *found at* regulations.gov.

55. *See e.g.*, 87 FR at 31,478 ("The EPA views the 1 percent of NAAQS threshold as the more appropriate threshold. . . .").

56. *See* 87 FR at 31,478.

any rational basis for preferring its older—and now superseded—2011 analysis. The 2018 analysis is superior and more appropriate for both identifying significant contributions and avoiding the likelihood of over-control. EPA should not disapprove Utah's Interstate Transport Ozone SIP based on an unfounded requirement to only use the 1 percent threshold.

i. EPA's new "after-the-fact" standard on a 1 ppb threshold is arbitrary and capricious.

While EPA may claim some deference for its decision-making, it is not unlimited. EPA cannot act in a manner that is inconsistent with the authorizing statute or that is arbitrary and capricious.[57] The agency must "articulate . . . a rational connection between the facts found and the choice made."[58] Particularly applicable here, when an agency's "new policy rests upon factual findings that contradict those which underlay its prior policy, or when its prior policy has engendered serious reliance interests," the Administrative Procedure Act requires an agency to provide "a more detailed justification" than it otherwise would.[59] Here, Utah and other states undoubtedly relied on the Threshold Guidance and "engendered serious reliance interests." EPA acknowledges as much in the Proposed

57. *See* 5 U.S.C. 706(2)(A).

58. *See Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

59. *See FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009).

Disapproval.[60] EPA's failure to acknowledge and account for Utah's "reliance interests" renders its Proposed Disapproval both arbitrary and capricious.

ii. EPA's insistence on a 1 percent threshold is not based on sound reasoning or science.

EPA engaged in robust statistical analysis in other guidance that defined a Significant Impact Level ("SIL") for ozone to be used as part of the Prevention of Significant Deterioration ("PSD") permitting process (setting it at 1 ppb) ("SILs Memo").[61] The purpose of the SILs Memo was to

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60. *See* 87 FR at 31,472.

61. Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program. Memorandum from Peter Tsirigotis, Director, EPA

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Appendix D

BHE COMMENTS ON THE PROPOSED INTERSTATE OZONE TRANSPORT RULE

EPA has presented the Proposed Rule as its best effort to implement the good neighbor provision of the Clean Air Act by adopting additional regulations to eliminate upwind contributions to nonattainment and interference with maintenance of the 2015 ozone standard in downwind states. While BHE appreciates these efforts, BHE believes that EPA's Proposed Rule goes too far, too fast, and imposes a program on western states that is not designed for them. BHE has identified significant concerns with the Proposed Rule and suggests potential solutions that would remedy those concerns and lead to a more reasonable, effective and achievable final rule that addresses the interstate transport of ozone while preserving the reliability of the bulk electric system and delivering a just and orderly transition for affected communities and western states.

I. Western States Should Be Removed from the Proposed Ozone Transport Rule.

EPA's attempt to incorporate western states into the Proposed Rule is a poor fit that is based on flawed modeling. The compliance timeline in the Proposed Rule severely limits compliance alternatives for affected EGUs, especially in the West. Installation of selective catalytic reduction (SCR) technology cannot be achieved at the scale and timing required by the Proposed Rule. Further, EPA has proposed restrictions and limitations on the NO_x allowance trading program that severely restrict, if not

eliminate, market opportunities to achieve compliance. Consequently, the Proposed Rule sets the stage for early coal-unit retirements that will undermine the reliability of the bulk electric system and adversely impact affected coal communities as well as customers and electricity consumers in the West.

After evaluating the Proposed Rule and its impacts on both EGUs and non-EGUs, BHE has concluded that EPA's basis for including western states in the rule is inadequately supported and that the costs and other negative impacts of including these states will far outweigh the benefits of pulling them into the proposal. The Proposed Rule does not recognize the unique scientific considerations underpinning ozone transport in the West. Nor does it account for the significant uncertainty and learning curve for sources in states that have not historically been regulated under federal NO_X allowance trading programs. These sources must invest substantial time and effort to prepare for compliance in only 11 months with a rule still in its formative stage (and even less time than that once the rule is finalized). Most importantly, BHE's analysis indicates that the stringency and timeline of the rule will introduce catastrophic reliability risk in western states where there are numerous affected sources that do not currently have the kinds of controls EPA has deemed cost-effective in its proposal. As a result, the Proposed Rule lays out a path for potentially disastrous reliability events for the West.

Finally, BHE is deeply concerned about applying the pre-determined, one-size-fits-all CSAPR approach to

western states given the administrative process EPA has employed. By proposing denial of SIPs in the western states where BHE operates affected EGUs (Nevada, Wyoming, and Utah) only after issuing a FIP that includes these states, EPA seems to signal that the outcome has been pre-determined. BHE believes states are best positioned to provide the right solutions to ozone transport and encourages EPA to follow the CAA procedures for states, not EPA, to act as the primary decision makers on how best to achieve the good neighbor provisions of the 2015 ozone NAAQS.

A. CSAPR is Not Well-Designed for Western States.

CSAPR is a longstanding regulatory program designed to address interstate ozone transport in eastern states. Now, for the first time, EPA proposes to expand CSAPR to four western states, with Nevada, Utah, and Wyoming included in the EGU trading program for the first time. While CSAPR has been a good fit for eastern states and has accomplished reductions in the transport of ozone to downwind states, there are a number of reasons that it does not make sense for EPA to pull western states into the CSAPR regulatory scheme. BHE urges EPA to reconsider inclusion of these states in the Proposed Rule.

As EPA is aware, the scientific underpinnings of ozone formation and transport in the West are fundamentally different from the East. First, background levels of ozone in the West are higher, in some cases just below the current 2015 ozone NAAQS of 70 parts per million (ppm).

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Some background ozone is naturally occurring due to nonanthropogenic sources of ozone precursors, including wildfires and stratospheric ozone intrusion, while some of it is directly attributable to international transport. Furthermore, in mountainous areas of the West, ozone formation is often attributable to, and exacerbated by, geographical and meteorological conditions, rather than the industrial source emissions targeted by EPA's ozone transport rule.[1]

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1. *See*, *e.g.*, *National Ambient Air Quality Standards for Ozone*, 80 FR 65,292, 65,300 (Oct. 26, 2015) ("observational and modeling analyses have concluded that O3 concentrations in some locations in the U.S. on some days can be substantially influenced by sources that cannot be addressed by domestic control measures. In particular, certain high-elevation sites in the western U.S. are impacted by a combination of non-U.S. sources like international transport, or natural sources such as stratospheric O3, and O3 originating from wildfire emissions."); Memorandum from Stephen D. Page, Director, OAQPS, EPA, "Information on Interstate Transport 'Good Neighbor' Provision for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) under Clean Air Act (CAA) Section 1 10(a)(2)(D)(i)(I)", at 4, January 22, 2015 (recommending ozone transport in western states should be evaluated on a case-by-case basis); CARB, California Infrastructure State Implementation Plan (SIP) Revision, at 15, January 19, 2016 (finding that in contrast to the East, ozone transport in the West has a much smaller proportion of local emissions and that the larger states and complex terrain in the West make modeling less accurate and helpful); Lin M, Fiore AM, Cooper OR, Horowitz LW, Langford AO, Levy H, et al., "Springtime high surface ozone events over the western United States: quantifying the role of stratospheric intrusions", *J Geophys Res.* 2012; 1 17:D00V22; Lefohn AS, Wernli H, Shadwick D, Oltmans SJ, Shapiro M., Quantifying the importance of stratospheric-tropospheric transport on surface ozone concentrations at high- and low-elevation monitoring sites in

Utah provided significant evidence, including preliminary photochemical modeling results, of how these factors influence ozone levels along the Northern Wasatch Front area of Utah.[2,3] Even if EPA does not recognize Utah's exceptional event arguments, it is beyond dispute that the ozone levels in western states are influenced by high background levels and international emissions. EPA has historically recognized the need to account for these additional factors when evaluating western states and that a case-by-case consideration of ozone impacts is necessary in the West.[4]

Furthermore, EPA's analysis and modeling in support of the Proposed Rule are grounded in methods and data that presume conditions in eastern states.[5] For example, EPA conducted national-scale modeling using a 12-kilometer

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the United States. *Atmos Environ.* 2012;62:646-656; Lefohn AS, Wernli H, Shadwick D, Limbach S, Oltmans SJ, Shapiro M., The importance of stratospheric-tropospheric transport in affecting surface ozone concentrations in the western and northern tier of the United States. *Atmos Environ.* 2011;45:4845-4857.

2. *See* Utah, Technical Support Document, Northern Wasatch Front (NWF), Utah: Failure to Attain 2015 Ozone National Ambient Air Quality Standard by Attainment Date; Reclassification and Disapproval of International Emissions Demonstration, January 2022, at 6-20.

3. *See* Memorandum from Barron Henderson and Heather Simon (EPA, OAQPS) on Modeled U.S. and International Contributions for 2015 Ozone NAAQS Nonattainment Areas (December 10, 2021).

4. 81 FR 74504, 74506, EPA, Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS, Oct. 26, 2016.

(km) resolution grid. However, that grid is too coarse to accurately model ozone in the mountainous western states where PacifiCorp and NV Energy operate.[6] This error is one reason that states are better suited to determine appropriate measures to address impacts on neighboring states. The most recent Denver ozone SIP used a 4-km grid to capture the meteorology and terrain more accurately in the very areas EPA claims are impacted by Utah and Wyoming.[7] The Denver modeling shows that the monitors EPA claims are significantly impacted by Utah and Wyoming will achieve or make significant progress towards attainment by 2026, without and before the most stringent requirements for EGUs go into effect under the Proposed Rule.[8]

Unlike eastern states, which have been subject to both CSAPR and its predecessor rules, the Clean Air Interstate Rule (CAIR) and the NO_X SIP Call, western states have

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5. 81 FR 74504, 74523-24 ("EPA is not addressing interstate emission transport in this action for the 11 western contiguous United States. The CSAPR framework builds on previous eastern-focused efforts to address collective contributions to interstate transport . . . ")

6. *See* Section I.B.

7. *See* 87 FR 20036, 27050, Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard (Apr. 6, 2022).

8. The problem of resolution is not solely a western state problem, but it is particularly pronounced in the mountainous western states where BHE businesses operate and where EPA claims significant impacts are occurring.

a tremendous uphill climb to prepare for participation in a NO_X allowance market. Affected sources in these states face the requirement to install costly controls on an infeasible timeline, involving significant decisions that must be made before the rule is even finalized, and, even then, will still have insufficient lead time. Under the Proposed Rule, affected sources will have only a few months to comply once the rule is finalized, and so must start immediately to develop a compliance strategy and facilitate the possible purchase and sale of allowances by the 2023 ozone season. In addition, EPA forces utilities to make decisions within an unreasonably short timeframe about investments in fossil fuel retrofit technologies that will have major ramifications on customer rates, reliability, and system operations. The Proposed Rule simply does not account for the fact that western states are beginning at a very different starting point than states that have historically been regulated for more than a decade under interstate NO_X trading schemes.

Finally, western states are already taking significant regulatory actions that would accomplish the goals that the ozone transport rule is designed to achieve. For example, western states are identifying additional controls for certain units under the Regional Haze program, and various facilities in these states have committed to cease burning coal or to retire coal units under the Clean Water Act's effluent limitations guidelines and Resource Conservation and Recovery Act's coal combustion residuals programs.

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Ramboll—Evaluation of Utah and Wyoming Ozone Contributions in EPA's Proposed Good Neighbor Plan for the 2015 Ozone NAAQS

4.5.1 Effects of Higher Resolution 4-km Grid in DM/NFR SIP Modeling

The DM/NFR ozone NAA roughly corresponds to the Front Range Urban Corridor that had a population of approximately 5 million and includes the Denver Metropolitan Statistical Area that had a population of almost 3 million people in the 2020 census. The DM/NFR ozone NAA also includes a portion of the Denver-Julesburg (D-J) oil and gas (O&G) basin. The urban and suburban areas and O&G production result in high density NO_X and VOC emissions in the DM/NFR NAA. Figure 4-3 displays the total NO_X and VOC emissions at 4-km resolution for the 2016 base case and differences between the 2016 and 2023 base cases. The high density NO_X and VOC emissions in the DM/NFR NAA and D-J O&G basin are clearly evident. In the CAMx model, emissions are emitted into and instantaneously dispersed evenly across the grid cell volume. In order to properly simulate ozone formation in the DM/NFR NAA, a high resolution grid cell size needs to be used. All of the Denver ozone SIPs in the past have used a 4-km grid resolution to simulate the correct meteorology and chemistry and resolve the urban plumes so that the model has a chance to reproduce the highest observed ozone concentrations. Use of a coarse 12-km grid will instantaneously disperse emissions across a grid cell volume that is almost an order magnitude larger than when a 4-km grid size is used making it difficult for

the model to reproduce the high observed ozone peaks due to overdiluting the ozone concentrations and its precursors.

Note that use of a coarse 12-km grid resolution will also reduce ozone peaks due to local sources in the Upwind State due to failure to resolve urban and other highly concentrated ozone precursor emission sources (e.g., industrial facilities, O&G, etc.) and their resultant ozone plumes. However, by the time the ozone and precursor concentrations from the Upwind State travel 100s of miles to the receptor in the downwind state the "plumes" will be many 12-km grid cells across so that the effects of the coarse resolution on underestimating ozone concentrations at the receptor in the downwind state due to emissions in the Upwind State is less important.

Figure 4-3. Total anthropogenic NO_X (top) and VOC (bottom) emissions (tons per day) within the CAMx 4-km Colorado domain used in the DM/NFR 2023 Severe/Moderate ozone SIP. Shown are emissions for the 2016 base case (left) and differences between the 2023 and 2016 base cases (right) (Source: RAQC Ozone Modeling Forum[28]).

28. https://ragc.egnyte.com/dl/kzR8aJm0zl/2022_Modeling_Forum_-_2023_and_2026_Design_Value_Projections.pdf

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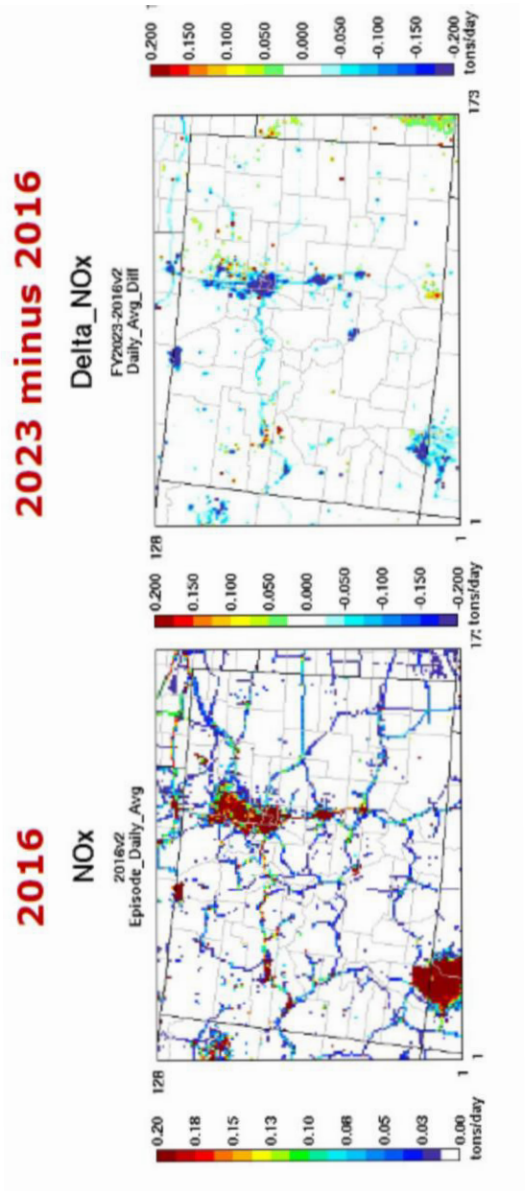
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FY2023-2016v2
Daily_Avg_Diff
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.200
tons/day
128
1
173
2016
NOx
2016v2
Episode_Daily_Avg
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0.18
0.15
0.13
0.10
0.08
0.05
0.03
0.00
tons/day

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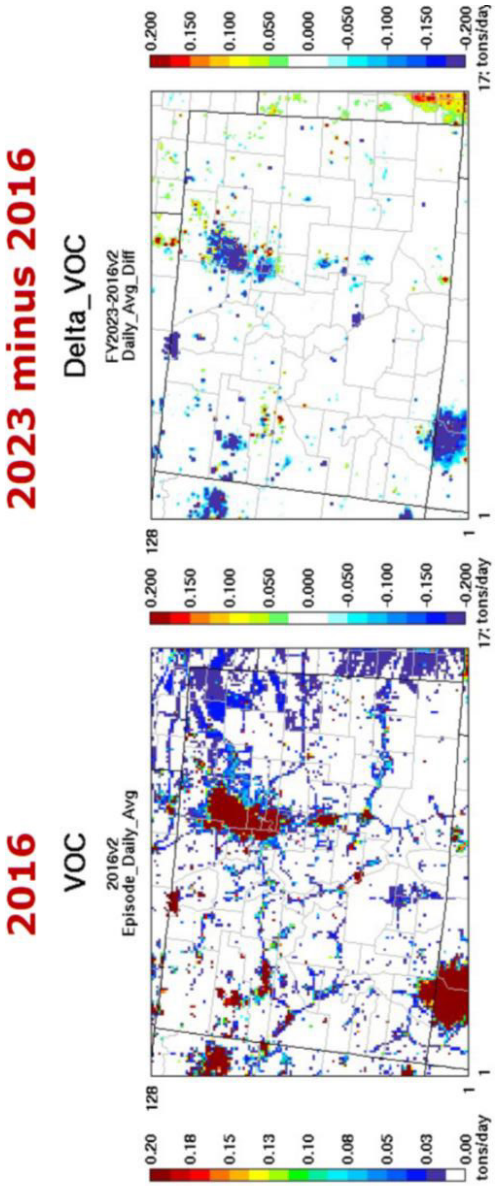
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VOC
2016v2
Episode_Daily_Avg
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0.15
0.13
0.10
0.08
0.05
0.03
0.00
tons/day
128
1
1
2023 minus 2016
Delta_VOC
FY2023-2016v2
Daily_Avg_Diff
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.200
17: tons/day
128
1
1

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4.5.2 Effects of Higher Resolved Meteorological Inputs on Ozone Concentrations in the DM/NFR Ozone SIP Modeling

Obtaining the correct depiction of meteorology is critically important for simulating ozone formation in the complex terrain conditions of the DM/NFR NAA. To better understand this importance, we first discuss the conditions that lead to the highest ozone concentrations in the DM/NFR NAA.

4.5.2.1 Conceptual Model of Ozone Formation in the DM/NFR NAA

The DM/NFR 2020 Serious ozone SIP for the 2008 ozone NAAQS (RAQC and CDPHE, 2020) included a report "Conceptual Model of High Ozone for the Denver Metro/North Front Range" (Ramboll, 2020). The highest ozone concentrations in the DM/NFR NAA are due to a combination of ozone transport and locally generated ozone under specific meteorological regimes that favor ozone photochemistry and limited dispersion. Reddy and Pfister (2016) explored the relationships between meteorology and ozone in the Rocky Mountain states and concluded that increases in upper level high pressure strength "lead to high July ozone in much of the western U.S., particularly in areas of elevated terrain near urban sources with high emissions of NO2 and other ozone precursors." In addition to bringing warmer temperatures, upper level ridges in this region reduce westerly winds at the surface and aloft to allow cyclic terrain-driven circulations that reduces transport away from sources. This includes the formation

of thermally driven upslope flows along the Front Range in the DM/NFR NAA where ozone and ozone precursors are transported up the slopes during the day and can return at night to lower elevations in large scale basin drainage (downslope) flows. Upper level ridges can also increase background ozone concentrations within the ridge. Ozone and NO_X concentrations build locally, and deeper vertical mixing in this region provides a potential mechanism for recapture of ozone in layers aloft (e.g., from transport or remnants of the previous days ozone) that are mixed down to the surface.

The three key elements of a conceptual model for high-concentration ozone episodes along Colorado's Front Range are:

1. The presence of an upper-level high pressure system or ridge.

2. Reduced westerly winds, especially during the day.

3. Thermally-driven upslope flow towards the Continental Divide during the day and downslope drainage flows into the Platte Valley at night. This diurnal cycle of winds enhances the potential for the accumulation of ozone precursors and ozone within the region, especially when this cyclic pattern recurs over a period of several days.

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4.5.2.2 Requirements for WRF Meteorological Model to Reproduce DM/NFR NAA Ozone Conceptual Model

In order for the Weather Research and Forecasting (WRF) meteorological model to reproduce the meteorological conditions that lead to the highest ozone concentrations in the DM/NFR NAA it needs to be able to simulate the high pressure system/ridge and the thermally driven slope flows. Getting the high pressure system or ridge correctly requires using analysis fields used in the WRF initial and boundary conditions (IC/BC) and four-dimensional data assimilation (FDDA) inputs. Such analysis fields that contain the presence of the high pressure/ridges include the North American Mesoscale Forecast System (NAM[29]) analysis fields that were used in the WRF simulations to develop the CAMx 2016 meteorological inputs for both the DM/NFR 2023 Severe/Moderate ozone SIP and Proposed Transport Rule CAMx 2016 modeling platforms.

For WRF to obtain an accurate depiction of the thermally driven slope flows requires the terrain inputs for the model to be representative of actual terrain. Figure 4-4 shows the terrain heights (meters above mean sea level, MSL) using 12-km and 4-km grid resolutions. Use of a 12-km grid resolution smooths the terrain and greatly reduces the terrain heights and the elevation differences of the "slopes" of the terrain along the Front Range. The slope between western Denver County to the continental divide spans approximately 7,800 feet in elevation using a 4-km grid resolution but only approximately 4,500 feet in elevation change using the 12-km grid resolution.

Thus, WRF's ability to reproduce the thermally driven daytime upslope and nighttime downslope flows will be severely compromised using a 12-km grid resolution and simulated much more accurately using a 4-km grid resolution because a 12-km grid resolution fails to resolve the terrain in the region.

The higher resolution complex terrain in the 4-km data, and in reality, will also affect transport of ozone and precursors from Wyoming to the DM/NFR NAA differently than if a 12-km grid resolution is used. The higher variable wind fields from more highly resolved terrain features will disperse ozone and precursors from Wyoming as they are transported to the DM/NFR NAA than if a 12-km grid resolution is used.

Figure 4-4. Representation of terrain (m MSL) over Colorado using a 12-km grid resolution (top) and 4-km grid resolution (bottom) (Note: domain is similar but not the same as the DM/NFR ozone SIP CAMx 4-km Colorado domain).

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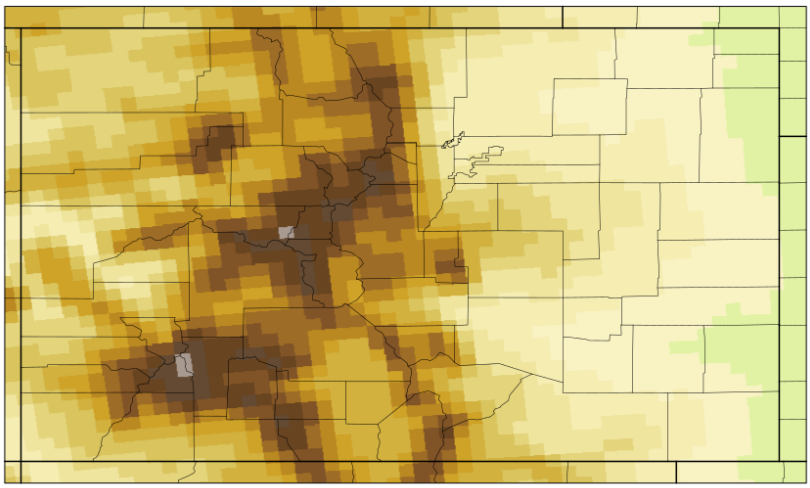

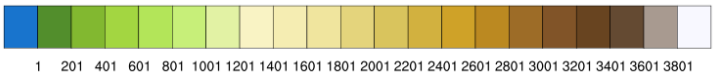
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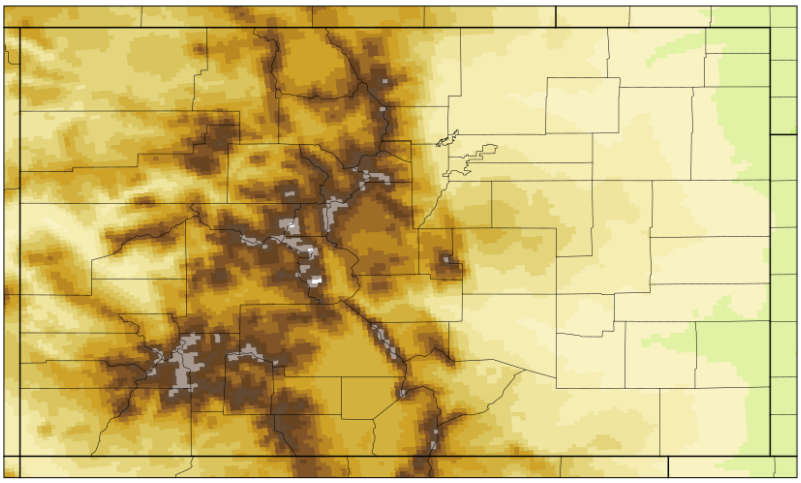

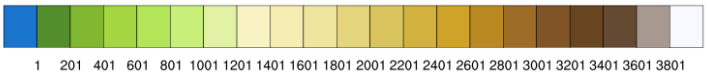
1 201 401 601 801 1001 1201 1401 1601 1801 2001 2201 2401 2601 2801 3001 3201 3401 3601 3801

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4.5.3 Comparison of CAMx Ozone Model Performance and Its Implications

We conducted an ozone model performance of the CAMx 2016 base case simulation used in the Proposed Transport Rule and compared it to the ozone performance of the DM/NFR 2023 Severe/Moderate ozone SIP CAMx S17 2016 base case simulation. At this time, only limited publicly available information is available on ozone model performance for the DM/NFR ozone SIP CAMx S17 2016 base case from presentations given at the May 18, 2022 RAQC Ozone Modeling Forum.[30]

Ozone model performance goals and criteria have been established by Emery and co-workers (2016) for the Normalized Mean Bias (NMB) and Normalized Mean Error (NME) model performance metrics. The NMB ozone model performance goal is ≤±5% and the NMB ozone performance criterion is ≤±15%. The NME ozone model performance goal and criterion are ≤15% and ≤25%, respectively.

Table 4-6 compare the NMB and NME performance statistics for the CAMx 2016 base case simulations performed as part of EPA's Proposed Transport Rule and as part of the DM/NFR 2023 Severe/Moderate ozone SIP. NMB and NME performance statistics that achieve the ozone model performance goals are colored green, and those that fall between the performance goals and criteria are colored yellow. The DM/NFR ozone SIP CAMx 2016 base case ozone performance is clearly performing better

30. https://raqc.org/event/2022-raqc-modeling-forum/

than the EPA Proposed Transport Rule CAMx 2016 base case at all four sites in the DM/NFR NAA. The EPA CAMx 2016 base case exhibits an ozone underestimation bias, which was expected given the coarse 12-km grid resolution used. At CHAT, the Proposed Transport Rule CAMx 2016 base case has an NMB underestimation of -7.6% while the DM/NFR 2023 Severe/Moderate ozone SIP has essentially zero bias (0.1%). The underestimation bias in the Proposed Transport Rule CAMx 2016 base case is even greater at the RFNO (-8.1%), NREL (-8.4%) and FTCW (-12.5%) sites while the DM/NFR ozone SIP CAMx 2016 base case bias achieves the bias performance goal by a wide margin.

Table 4-6. Comparison of NMB and NME ozone performance statistics (%) at the four key monitoring sites in the DM/NFR NAA and the CAMx 2016 base case simulations from EPA's Proposed Transport Rule and the DM/NFR Severe/Moderate ozone SIP. NMB/NME performance statistics that meet the ozone model performance goal are colored green.

Site	EPA Proposed Rule		DM/NFR Ozone SIP[a]	
	NMB	NME	NMB	NME
CHAT	-7.6%	11.6%	0.1%	9.2%
RFNO	-8.1%	11.3%	-0.4%	8.8%
NREL	-8.4%	11.9%	-2.0%	8.6%
FTCW	-12.5%	14.3%	-2.5%	7.8%

a. Source: https://raqc.egnyte.com/dl/8AGJMMksXC/2022_Modeling_Forum_-_2016_Base_Year_Modeling_Platform_Updates.pdf_

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Ozone attainment/nonattainment is determined by the ozone design value (DV) that is defined as the three-year average of the fourth highest maximum daily average 8-hour (MDA8) ozone concentrations. Thus, how well the model simulates the four highest observed MDA8 ozone concentrations is an important model performance attribute. Table 4-7 compares the predicted and observed four highest MDA8 ozone concentrations at Chatfield during 2016 from the Proposed Transport Rule and DM/NFR Severe/Moderate ozone SIP CAMx 2016 base case simulations. The highest observed MDA8 ozone concentration at Chatfield during 2016 was 86.6 ppb that was underestimated by the Proposed Transport Rule CAMx 2016 base case (74.9 ppb) by 11.7 ppb (-13.5%). Whereas, the DM/NFR ozone SIP CAMx 2016 base case highest estimated ozone concentration at Chatfield (86.4) matched the observed value (86.6 ppb) almost exactly (within 0.2 ppb or 0.0% difference). The fourth highest observed MDA8 ozone concentration at Chatfield (78.0 ppb) is underestimated by the Proposed Transport Rule CAMx 2016 base case (71.9 ppb) by 6.1 ppb (-7.8%), while the DM/NFR ozone SIP CAMx base case fourth highest ozone at Chatfield (78.1 ppb) matches the observed fourth highest ozone very well (0.1 ppb and 0.0% difference).

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Table 4-7. Comparison of the observed and modeled four highest MDA8 ozone concentrations at the Chatfield monitoring site in 2016 for the EPA Proposed Transport Rule and DM/NFR 2023 Severe/Moderate ozone SIP CAMx 2016 base case simulations.

Observed Ozone (ppb)	EPA Proposed Transport Rule		DM/NFR Ozone SIP[a]	
	Ozone (ppb)	Percent Difference	Ozone (ppb)	Percent Difference
86.6	74.9	-13.5%	86.4	-0.2%
81.0	73.1	-9.8%	81.6	0.7%
80.3	72.6	-9.6%	80.1	-0.2%
78.0	71.9	-7.8%	78.1	0.1%

a. Source: https://raqc.egnyte.com/dl/8AGJMMksXC/2022_Modeling_Forum_-_2016_Base_Year_Modeling_Platform_Updates.pdf_

Table 4-8 compares the predicted and observed four highest MDA8 ozone concentrations at the Rocky Flats North (RFNO) monitoring site in the DM/NFR NAA and the Proposed Transport Rule and DM/NFR Severe/Moderate ozone SIP CAMx 2016 base case simulations. The ozone under-prediction bias of the Proposed Transport Rule CAMx 2016 base case at RFNO is even greater than at CHAT with the four highest observed ozone concentrations underestimated by -11% to -19%. The DM/NFR ozone SIP CAMx 2016 base case also underestimates the four highest observed MDA8 ozone concentrations at RFNO but the underestimation bias (-4% to -10%) is approximately half of the Proposed

Transport Rule underestimation bias. For example, the observed fourth highest MDA8 ozone at RFNO (79.5%) is underestimated by the Proposed Transport Rule by -11% (70.9 ppb) but is only underestimated by the DM/NFR ozone SIP CAMx 2016 base case by -4% (76.3 ppb), which achieves the ≤±5% ozone performance goal.

Table 4-8. Comparison of the observed and modeled four highest MDA8 ozone concentrations at the Rocky Flats North monitoring site in 2016 for the EPA Proposed Transport Rule and DM/NFR 2023 Severe/ Moderate ozone SIP CAMx 2016 base case simulations.

Observed Ozone (ppb)	EPA Proposed Transport Rule		DM/NFR Ozone SIP[a]	
	Ozone (ppb)	Percent Difference	Ozone (ppb)	Percent Difference
89.6	72.9	-18.6%	81.1	-9.5%
82.4	72.7	-12.4%	77.8	-5.6%
81.6	72.6	-11.0%	77.5	-5.0%
79.5	70.9	-10.8%	76.3	-4.0%

a. Source: https://raqc.egnyte.com/dl/8AGJMMksXC/2022_Modeling_Forum_-_2016_Base_Year_Modeling_Platform_Updates.pdf_

The performance of the two CAMx 2016 base case simulations in predicting the highest ozone concentrations at NREL is shown in Table 4-9. Both CAMx 2016 base cases exhibit an underestimation of the four highest observed MDA8 ozone concentrations at NREL with the Proposed Transport Rule underestimation (-11% to -13%)

being worse than the DM/NFR ozone SIP CAMx 2016 base case (-6% to -10%).

Table 4-9. Comparison of the observed and modeled four highest MDA8 ozone concentrations at the NREL monitoring site in 2016 for the EPA Proposed Transport Rule and DM/NFR 2023 Severe/Moderate ozone SIP CAMx 2016 base case simulations.

Observed Ozone (ppb)	EPA Proposed Transport Rule		DM/NFR Ozone SIP[a]	
	Ozone (ppb)	Percent Difference	Ozone (ppb)	Percent Difference
88.6	78.0	-12.0%	81.3	-8.2%
86.3	74.3	-13.9%	80.3	-9.5%
83.3	74.1	-11.0%	78.3	-6.0%
83.3	73.8	-11.4%	76.1	-8.6%

a. Source: https://raqc.egnyte.com/dl/8AGJMMksXC/2022_Modeling_Forum_-_2016_Base_Year_Modeling_Platform_Updates.pdf_

4.6 Conclusions On Future Year Projected Ozone Design Values at DM/NFR Nonattainment/Maintenance Receptors

Based on scientific technical arguments, the coarse 12-km grid resolution used in the Proposed Transport Rule CAMx modeling will likely overstate future year design value projections. This was confirmed by the DM/NFR 2023 Severe/Moderate ozone SIP CAMx 4-km grid resolution modeling that produced lower future year

projected design values resulting in Chatfield and Rocky Flats North no longer being nonattainment/maintenance receptors in 2026. As Chatfield was the only receptor that Wyoming was linked to, the Proposed Transport Rule overcontrols Wyoming emissions by proposing 2026 EGU and non-EGU control in Wyoming even though it is not contributing to nonattainment or interfering in maintenance of the 2015 ozone NAAQS at any receptor in a downwind state.

Utah was linked to three receptors in the DM/NFR NAA (CHAT, RFNO and NREL). Two of these receptors (CHAT and RFNO) become attainment receptors based on the refined DM/NFR Severe/Moderate ozone SIP CAMx modeling, although NREL receptor remained a nonattainment receptor in the DM/NFR ozone SIP CAMx modeling (see Table 4-5). However, Utah has a 0.90 ppb ozone contribution to the NEWL receptor in 2026 and, as discussed in Chapter 7, this contribution is not a statistically significant contribution to an ozone design value. This argues that Utah should also not be subject to the 2026 EGU and non-EGU controls in the Proposed Transport Rule.

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5.0 UPWIND STATE OZONE CONTRIBUTIONS AT DOWNWIND STATE RECEPTORS ARE OVERSTATED

As described in detail in Chapter 1, an Upwind State 2023 and 2026 ozone contribution to an ozone design value at a nonattainment/maintenance receptor in a downwind State is based on the Contribution Factor (CF) that is the ratio of the Upwind State MDA8 ozone contribution to the receptor divided by the total MDA8 ozone at the receptor averaged over the top 10 CAMx 2023 modeled total MDA8 ozone days at the receptor. The Contribution Factor is multiplied by the 2023 and 2026 average ozone design value (Avg DV) to obtain the Upwind State 2023 and 2026 ozone contribution to the downwind receptor:

$$CF = \sum UpwindState\_Ozone / \sum Total\_Ozone$$

$$UpwindState\_Ozone\_Contribution = CF \times Ozone\_AvgDV$$

Thus, any assumptions, errors or omissions that would either: (1) increase the total MDA8 ozone concentrations at the receptor (i.e., increase the denominator in CF); or (2) reduce Upwind State's ozone contribution at the receptor (i.e., decrease the numerator in CF), would reduce the Contribution Factor and the Upwind State's ozone contribution to the downwind receptor 2023 and 2026 ozone design values.

Appendix D

5.1 Missing Emissions in Proposed Transport Modeling Results in Overstating Utah's and Wyoming's Ozone Contribution to Receptors in the DM/NFR NAA

The Proposed Transport Rule CAMx modeling failed to include NO_X emissions from lightning (LNO_X). This is particularly important in the Front Range area of Colorado where summer thunderstorms regularly occur. Emissions from lightning can be a significant source of NO_X concentrations and resultant ozone formation. Zhang and co-workers (2003) estimate that 5% of the annual and 14% of the summer NO_X emissions in the U.S. comes from lightning. Kang and co-workers (2020) analyzed the effects of including LNO_X emissions and found they were particularly important for simulating ozone in the U.S. Mountain West States (MWS), which include Colorado, Utah and Wyoming, and found LNO_X emissions could increase MDA8 ozone concentrations by up to 17 ppb and concluded "summertime surface-level O3 levels in the MWS region could be significantly influenced by lightning NO_X." (Kang et al., 2020). If naturally occurring LNO_X emissions were included in the Proposed Transport Rule CAMx modeling that would increase the total MDA8 ozone concentrations at the DM/NFR NAA receptors resulting in a reduced Utah and Wyoming Contributions Factors and lower Utah and Wyoming ozone contributions to 2023 and 2026 ozone design values at the DM/NFR NAA receptors.

EPA developed the 2016v2 modeling platform 2016, 2023, 2026 and 2032 model-ready emissions for the CMAQ

model and converted them to the CAMx format using a CMAQ2CAMx emissions converter. In doing the CMAQ to CAMx emissions conversion for the Proposed Transport Rule CAMx modeling, EPA dropped methane (CH4) emissions and some secondary organic aerosol (SOA) precursor species. The SOA precursors probably have minimal effect on ozone formation but methane acts

* * *

APPENDIX E — EXCERPTS FROM RESPONSE TO COMMENTS DOCUMENT (EPA-HQ-OAR-2021-0663-0083)

Commenter: West Virginia Department of Environmental Protection

Commenter ID: 49

Docket ID: EPA-R03-OAR-2021-0873

Comment:

In the WV 2015 Ozone Good Neighbor SIP, DAQ applied independent modeling performed by Alpine Geophysics utilizing 2023 projected emissions. Alpine modeled at a finer 4-km grid within the maintenance and nonattainment receptor areas rather than the 12-km grid utilized by EPA. Also, at this time, the Lake Michigan Air Directors Consortium ("LADCO") regional planning organization ("RPO") performed similar modeling. All three of these efforts modeled remarkably comparable impacts at the downwind monitor locations. As such, DAQ is further puzzled by EPA's abandonment of its own modeling results by this proposed disapproval action.

Response

See Section V.A.4. of the preamble for our general response to comments on the use of updated modeling to support the EPA's action. The EPA notes that the EPA is not disapproving any SIP submission for its choice of modeling. The EPA's evaluations of each SIP submission

were explained at proposal. *See*, *e.g.*, 87 FR 9867-9869 (February 22, 2022) (Minnesota); 87 FR 9818-9824 (February 22, 2022) (Oklahoma); 87 FR 31492-31493 (May 24, 2022) (Nevada); and 87 FR 31477-31483 (May 24, 2022) (Utah). We respond to several additional specific comments here.

One commenter claimed, "By delaying its decision on Maryland's submittal for nearly 2.5 years, the EPA moved the goal post for Maryland—an act the DC Circuit admonished in *New York v. EPA*, 964 F.3d 1214, 1223 (D.C. Cir. 2020)." First, as explained in the preamble, the timing of the EPA's action is not moving the goal posts, nor does availing ourselves of the most recent 2015 ozone transport modeling and monitoring information do so. Second, *New York* is inapposite. The court there found fault with the EPA's denial of a CAA section 126(b) petition from New York, which had identified many upwind-state sources with relatively large NOX emissions that the state alleged significantly contributed in violation of the good neighbor provision. The court found the EPA's explanation for why the state had not made out at least a facially plausible showing of significant contribution to be arbitrary and capricious. The court noted that downwind petitioning states may lack the ability to conduct the kinds of analysis the Agency's denial suggested may be required and also found internal inconsistencies in the Agency's position during litigation. None of that is relevant here. First, this holding was not about air quality determinations, but rather Step 3 analysis of source emissions reduction potential. Second, upwind states are charged by the Act with evaluating, defining, and prohibiting their sources' significant contribution. Unlike a downwind jurisdiction,

they possess all requisite authority to undertake an analysis of emissions and emissions reduction potential within their borders. *See generally* CAA section 110(a)(2). Nor is the Agency obligated to define "significant contribution" for upwind states before acting on these SIP submissions. *See EPA v. EME Homer City*, 572 U.S. 489, 508-09 (2014).

APC and PacifiCorp both cite *Texas v. EPA*, 829 F.3d 405 (5th Cir. 2016) to argue that "EPA's approval or disapproval of a SIP should adhere to the guidance, data, and evidence available and on the record at the time of EPA's timely review of the SIP." In *Texas*, the 5th Circuit granted a preliminary stay of the EPA's disapproval of Oklahoma's and Texas' regional haze SIP submissions and promulgation of FIPs and did not reach the merits of either the EPA's assessment of the SIP submissions' compliance with the requirements of the CAA or the FIPs.[2] Although the court noted that the EPA proposed amendments to the regional haze rule subsequent to Texas and Oklahoma submitting regional haze SIP submissions, that proposal was not relevant to the submissions before the court.[3] Moreover, the EPA has not promulgated any regulations to implement CAA section 110(a)(2)(D)(i)(I).

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2. *Texas v. EPA*, 829 F.3d 405 (5th. Cir. 2016)

3. *See*, *e.g.*, Protection of Visibility: Amendments to Requirements for State Plans; Proposed Rule, 81 Fed. Reg. 26941, 26944 (May 4, 2016) (explaining that the proposed "changes would apply to periodic comprehensive state implementation plans developed for the second and subsequent implementation periods and for progress reports submitted subsequent to those plans." And that EPA "[did] not intend for the proposed changes to affect the development of state plans for the first implementation period or the first progress reports due under the existing Regional Haze Rule.")

Rather, EPA is applying its longstanding framework for implementing CAA section 110(a)(2)(D)(i)(I) while recognizing and considering any alternative approaches states presented. EPA further notes that to the extent APC objects to EPA's consideration of 2016v2 modeling or the updated 2016v3 modeling (adjusted in response to public comment on this action), Alabama's June 21, 2022, SIP submission was submitted after the EPA made the 2016v2 modeling available and included arguments with respect to that modeling, which the EPA has evaluated in this final action.

APC, The Luminant Companies, and PacifiCorp quote *Sierra Club v. EPA*, 356 F.3d 296, 308 (D.C. Cir. 2004): "To require states to revise completed plans every time a new model is announced would lead to significant costs and potentially endless delays in the approval process." In that case, Sierra Club challenged EPA's conditional approval of Maryland, Virginia, and Washington, D.C.'s attainment plans to address the Washington, D.C. Metropolitan Area's "Severe" classification for several reasons. 356 F.3d at 300. One reason was that the rate-of-progress plans relied on an older emissions model (MOBILE5 as opposed to the more recent MOBILE6). *Id*. EPA regulation specifically required states to use the latest emission model available during the development their rate-of-progress plans for the purposes of meeting Severe requirements, CAA section 172(c)(3); 40 CFR 51.112(a)(1), but because MOBILE6 became available one month before these SIP submissions were submitted, the EPA accepted the rateof-progress plan based on MOBILE5. 356 F.3d at 308. The court agreed it was reasonable for EPA to

not require Maryland, Virginia, and Washington, D.C. to revise their rate-of-progress plans using MOBILE6. *Id*. The EPA notes the timing consideration quoted by commenters related to attainment planning in a Serious nonattainment area. Here, however, the EPA has no regulations that require any state to use any particular type of model to address statutory requirements under CAA section 110(a)(2)(D)(i)(I), nor is the EPA disapproving any SIP submission on the basis of its choice of modeling (as compared to EPA's evaluation of the *results* of the modeling). Further, the *Sierra Club* case does not stand for the proposition that EPA is prevented from considering the most up-to-date data in assessing whether upwind states may be potentially significantly contributing to downwind nonattainment or maintenance.

APC and The Luminant Companies cite *Wisconsin v. EPA*, 938 F.3d 303, 336 (D.C. Cir. 2019) for the premise that the EPA's disapproval of a SIP submission on the basis of "reliance on data compiled after the SIP action deadline" may be challenged. The EPA acknowledges that *Wisconsin* noted such was the States' argument, but the D.C. Circuit did not opine on the validity of the assertion since it was not relevant to the court's evaluation of the CSPAR Update FIP.

A comment specifically pointed to the EPA's proposed error correction of its approval of Delaware's SIP submission (which is a component of the proposed FIP rulemaking published April 6, 2022) to suggest the EPA had created an unworkable standard for states. The commenter went on to argue that the EPA must approve Tennessee's

SIP submission based on the information available at the time Tennessee submitted it to the EPA. However, this argument is illogical. If the EPA were to do that, it would be treating Delaware and Tennessee dissimilarly. In fact, the proposed error correction for Delaware only illustrates the futility of commenters' arguments for using outdated information to approve their SIP submissions. Had the EPA done that, then just as it proposed for Delaware, the Agency would likely have simply conducted error corrections of those approvals in light of the updated projections of air quality and contributions in 2023 that are now available.

Finally, it bears observance that if the EPA's evaluation of information regarding 2023 projections was arrested at the time of some deadline in the past or with the issuance of some older set of modeling results, then the purpose of notice and comment rulemaking would itself be frustrated, because no matter what arguments commenters could make about more recent or current real-world conditions or updated projections regarding 2023, the Agency would be forced to ignore them. As an example, the EPA would be obligated to ignore many of the comments on these proposals providing updates to the EPA's emissions inventories, which we have considered in developing the 2016v3 modeling of 2023.

In response to Louisiana Chemical Association, the EPA clarifies that the Agency found Louisiana's SIP submission complete on November 15, 2019. In response to Tennessee Department of Environment and Conservation, the EPA notes that the Agency is deferring final action on

Tennessee's good neighbor SIP submission at this time. In response to Midwest Ozone Group, the EPA notes that the Agency met with Multi-Jurisdictional Organizations such as Central States Air Resource Agencies and others in Summer 2021 to discuss the concerns outlined in the July 2021 letter cited in the comment.4 The EPA subsequently made emissions data available on September 20, 2021, as discussed in more detail in the preamble in Sections II.C and III.A.1.

Other issues raised by these comments are addressed in the preamble in Sections II.C, II.D, III.A.1., V.A., and V.B.2, and V.A.6, as well as in Section 1.2 (Guidance for SIP Submissions), Section 5 (Updates to Modeling and Changes in Linkages), 6.1.2 (Step 1 Receptors Linked to Texas), 7.4 (August 2018 Memorandum), 8.1 (Determination of Significant Contribution), 10.2 (SIP Call), and 10.3 (Cooperative Federalism and the EPA's Authority).

* * *

Commenter: Utah Division of Air Quality

Commenter ID: 47

Docket ID: EPA-R08-OAR-2022-0315

Comment:

The benefit of cooperative federalism is having the autonomy to do what's best for the state, but do so in

partnership with EPA to ensure that the CAA intent and requirements are met.

In this same spirit, UDAQ engaged early and often with our counterparts at Region 8 in the development of our interstate transport SIP. Through this collaboration and EPA's guidance, Utah selected the alternative threshold of 1 ppb. [...] Thus, UDAQ was surprised when EPA proposed to include Utah in the proposed FIP, and subsequently disapproved the state's SIP based in large part on the selection of the 1 ppb over the 1% of the NAAQS threshold. If the 1 ppb threshold was in fact inappropriate for the development of this SIP, EPA should have communicated that view to UDAQ during the early engagement and development process or during the state's public comment period. Additionally, EPA released no new guidance directing states to use a 1% threshold either prior to or after SIP submittal deadlines.

Response

Some commenters assert that the EPA did not provide sufficient input to states during the development of the SIP submissions, while others allege that the EPA led the states astray or implied to states that the SIP submissions were approvable. The EPA is required under CAA section 110 to review a SIP submission revision that has been formally submitted; based on the EPA's determination of whether that submission meets applicable CAA requirements, the EPA must then approve or disapprove the SIP submission. There is no CAA requirement that the EPA must review, evaluate, and comment on a state's draft SIP submission

revision during the state rulemaking process, and no legal basis for states to assume that the EPA's silence during a state public comment period constitutes the Agency's endorsement of such SIP submission revision. Where the EPA did communicate views to these states on draft SIP submission revisions, the EPA disagrees that such preliminary feedback should now bind the Agency, and the EPA disagrees that we could in any way lawfully provide "implied consent" to states regarding their draft SIP submissions before they have completed the required rulemaking processes at both the state and federal level. After all, EPA cannot assure any state in advance of the EPA's public notice and comment process what the EPA's final action on a SIP submission will be. *Catawba County v. EPA*, 571 F.3d 20, 34 (D.C. Cir. 2009) ("[a]n agency pronouncement is not deemed a binding regulation merely because it may have some substantive impact, as long as it leave[s] the administrator free to exercise his informed discretion.") citing *Panhandle Producers & Royalty Owners Ass'n v. Econ. Regulatory Admin.*, 822 F.2d 1105, 1110 (D.C. Cir. 1987) (quoting *Brock v. Cathedral Bluffs Shale Oil Co.*, 796 F.2d 533, 537 (D.C. Cir. 1986) (internal quotation marks omitted))).

The EPA encourages state air agencies to engage as early as possible with the Agency on the development of any SIP submission revisions in an effort to address all technical and policy approvability issues prior to submitting a final SIP submission package and appreciates states' willingness to involve regional offices at the initial SIP submission development stage. Further, the EPA makes its best efforts to work closely with states, but EPA

cannot be expected to provide states definitive guidance on what will ultimately be approvable. Nonetheless, the suggestions we made to states on their SIP submissions in this instance are not inconsistent with the final action we are now taking.

Other issues raised by these comments are addressed in Section V.A.3., V.A.6., and V.B.7. of the preamble and the following sections: 1.1 (Timing of SIP Actions), 1.2 (Guidance for SIP Submissions), 7.4 (August 2018 Memorandum), 10.3 (Cooperative Federalism and the EPA's Authority), 11.6 (Economic Impacts), and 11.12 (Consent Decrees).

Appendix E

Commenter: PacifiCorp (Attachment – Ramboll Evaluation)

Commenter ID: 38

Docket ID: EPA-R08-OAR-2022-0315

Comment:

4.5.1 Effects of Higher Resolution 4-km Grid in DM/NFR SIP Modeling

[...] In order to properly simulate ozone formation in the DM/NFR NAA, a high resolution grid cell size needs to be used. All of the Denver ozone SIPs in the past have used a 4-km grid resolution to simulate the correct meteorology and chemistry and resolve the urban plumes so that the model has a chance to reproduce the highest observed ozone concentrations. Use of a coarse 12-km grid will instantaneously disperse emissions across a grid cell volume that is almost an order of magnitude larger than when a 4- km grid size is used making it difficult for the model to reproduce the high observed ozone peaks due to overdiluting the ozone concentrations and its precursors.

Note that use of a coarse 12-km grid resolution will also reduce ozone peaks due to local sources in the Upwind State due to failure to resolve urban and other highly concentrated ozone precursor emission sources (e.g., industrial facilities, O&G, etc.) and their resultant ozone plumes. However, by the time the ozone and precursor concentrations from the Upwind State travel 100s of miles

to the receptor in the downwind state the "plumes" will be many 12-km grid cells across so that the effects of the coarse resolution on underestimating ozone concentrations at the receptor in the downwind state due to emissions in the Upwind State is less important.

[...]

4.5.2 Effects of Higher Resolved Meteorological Inputs on Ozone Concentrations in the DM/NFR Ozone SIP Modeling

Obtaining the correct depiction of meteorology is critically important for simulating ozone formation in the complex terrain conditions of the DM/NFR NAA. [...]

4.5.2.1 Conceptual Model of Ozone Formation in the DM/NFR NAA

The DM/NFR 2020 Serious ozone SIP for the 2008 ozone NAAQS (RAQC and CDPHE, 2020) included a report "Conceptual Model of High Ozone for the Denver Metro/North Front Range" (Ramboll, 2020). The highest ozone concentrations in the DM/NFR NAA are due to a combination of ozone transport and locally generated ozone under specific meteorological regimes that favor ozone photochemistry and limited dispersion. Reddy and Pfister (2016) explored the relationships between meteorology and ozone in the Rocky Mountain states and concluded that increases in upper-level high pressure strength "lead to high July ozone in much of the western U.S., particularly in areas of elevated terrain near urban sources with high

emissions of NO2 and other ozone precursors." In addition to bringing warmer temperatures, upper-level ridges in this region reduce westerly winds at the surface and aloft to allow cyclic terrain-driven circulations that reduces transport away from sources. This includes the formation of thermally driven upslope flows along the Front Range in the Denver NAA where ozone and ozone precursors are transported up the slopes during the day and can return at night to lower elevations in large scale basin drainage (downslope) flows. Upper-level ridges can also increase background ozone concentrations within the ridge. Ozone and NOX concentrations build locally, and deeper vertical mixing in this region provides a potential mechanism for recapture of ozone in layers aloft (e.g., from transport or remnants of the previous days ozone) that are mixed down to the surface.

The three key elements of a conceptual model for high-concentration ozone episodes along Colorado's Front Range are:

1. The presence of an upper-level high pressure system or ridge.

2. Reduced westerly winds, especially during the day.

3. Thermally-driven upslope flow towards the Continental Divide during the day and downslope drainage flows into the Platte Valley at night. This diurnal cycle of winds enhances the potential for the accumulation of

ozone precursors and ozone within the region, especially when this cyclic pattern recurs over a period of several days.

4.5.2.2 Requirements for WRF Meteorological Model to Reproduce DM/NFR NAA Ozone Conceptual Model

In order for the Weather Research and Forecasting (WRF) meteorological model to reproduce the meteorological conditions that lead to the highest ozone concentrations in the Denver NAA it needs to be able to simulate the high pressure system/ridge and the thermally driven slope flows. Getting the high pressure system or ridge correctly requires using analysis fields as inputs into WRF that reflects their presence that are used in the WRF initial and boundary conditions (IC/BC) and four-dimensional data assimilation (FDDA) inputs. Such analysis fields that contain the presence of the high pressure/ridges include the North American Mesoscale Forecast System (NAM29) analysis fields that were used in the WRF simulations to develop the CAMx 2016 meteorological inputs for both the DM/NFR 2023 Severe/Moderate ozone SIP and Proposed Transport Rule CAMx 2016 modeling platforms.

For WRF to obtain an accurate depiction of the thermally driven slope flows requires the terrain inputs for the model to be representative of actual terrain. Use of a 12-km grid resolution smooths the terrain and greatly reduces the terrain heights and the elevation differences of the "slopes" of the terrain along the Front Range. The slope between western Denver County to the continental divide spans approximately 7,800 feet in elevation using

a 4-km grid resolution but only approximately 4,500 feet in elevation change using the 12-km grid resolution. Thus, WRF's ability to reproduce the thermally driven daytime upslope and nighttime downslope flows will be severely compromised using a 12-km grid resolution and simulated much more accurately using a 4-km grid resolution because a 12-km grid resolution fails to resolve the terrain in the region.

The higher resolution complex terrain in the 4-km data, and in reality, will also affect transport of ozone and precursors from Wyoming to the Denver NAA differently than if a 12-km grid resolution is used. The higher variable wind fields from more highly resolved terrain features will disperse ozone and precursors from Wyoming as they are transported to the Denver NAA than if a 12-km grid resolution is used that smooths the actual terrain features.

[...]

4.5.3 Comparison of CAMx Ozone Model Performance and Its Implications

[Ramboll] conducted an ozone model performance of the CAMx 2016 base case simulation used in the Proposed Transport Rule and compared it to the ozone performance of the DM/NFR 2023 Severe/Moderate ozone SIP CAMx S17 2016 base case simulation. At this time, only limited publicly available information is available on ozone model performance for the DM/NFR ozone SIP CAMx S17 2016 base case from presentations given at the May 18, 2022 RAQC Ozone Modeling Forum.

Appendix E

Ozone model performance goals and criteria have been established by Emery and co-workers (2016) for the Normalized Mean Bias (NMB) and Normalized Mean Error (NME) model performance metrics. The NMB ozone model performance goal is ≤±5% and the NMB ozone performance criterion is ≤±15%. The NME ozone model performance goal and criterion are ≤15% and ≤25%, respectively.

[...]

The DM/NFR ozone SIP CAMx 2016 base case ozone performance is clearly performing better than the EPA Proposed Transport Rule CAMx 2016 base case at all four sites in the DM/NFR NAA. The EPA CAMx 2016 base case exhibits an ozone underestimation bias, which was expected given the coarse 12-km grid resolution used. At CHAT, the Proposed Transport Rule CAMx 2016 base case has an NMB underestimation of -7.6% while the DM/NFR 2023 Severe/Moderate ozone SIP has essentially zero bias (0.1%). The underestimation bias in the Proposed Transport Rule CAMx 2016 base case is even greater at the RFNO (-8.1%), NREL (-8.4%) and FTCW (-12.5%) sites while the DM/NFR ozone SIP CAMx 2016 base case bias achieves the bias performance goal by a wide margin.

[...]

Ozone attainment/nonattainment is determined by the ozone design value (DV) that is defined as the three-year average of the fourth highest maximum daily average 8-hour (MDA8) ozone concentrations.

Thus, how well the model simulates the four highest observed MDA8 ozone concentrations is an important model performance attribute. The highest observed MDA8 ozone concentration at Chatfield during 2016 was 86.6 ppb that was underestimated by the Proposed Transport Rule CAMx 2016 base case (74.9 ppb) by 11.7 ppb (-13.5%). Whereas, the DM/NFR ozone SIP CAMx 2016 base case highest estimated ozone concentration at Chatfield (86.4) matched the observed value (86.6 ppb) almost exactly (within 0.2 ppb or 0.0% difference). The fourth highest observed MDA8 ozone concentration at Chatfield (78.0 ppb) is underestimated by the Proposed Transport Rule CAMx 2016 base case (71.9 ppb) by 6.1 ppb (-7.8%), while the DM/NFR ozone SIP CAMx base case fourth highest ozone at Chatfield (78.1 ppb) matches the observed fourth highest ozone very well (0.1 ppb and 0.0% difference).[...] The ozone under-prediction bias of the Proposed Transport Rule CAMx 2016 base case at RFNO is even greater than at CHAT with the four highest observed ozone concentrations underestimated by -11% to -19%. The DM/NFR ozone SIP CAMx 2016 base case also underestimates the four highest observed MDA8 ozone concentrations at RFNO but the underestimation bias (-4% to -10%) is approximately half of the Proposed Transport Rule underestimation bias. For example, the observed fourth highest MDA8 ozone at RFNO (79.5%) is underestimated by the Proposed Transport Rule by -11% (70.9 ppb) but is only underestimated by the DM/NFR ozone SIP CAMx 2016 base case by -4% (76.3 ppb), which achieves the ≤±5% ozone performance goal.

[...]

Appendix E

4.6 Conclusions On Future Year Projected Ozone Design Values at DM/NFR Nonattainment/Maintenance Receptors

Based on scientific technical arguments, the coarse 12-km grid resolution used in the Proposed Transport Rule CAMx modeling will likely overstate future year design value projections. This was confirmed by the DM/NFR 2023 Severe/Moderate ozone SIP CAMx 4-km grid resolution modeling that produced lower future year projected design values resulting in Chatfield and Rocky Flats North no longer being nonattainment/maintenance receptors in 2026.

[...]

Utah was linked to three receptors in the DM/NFR NAA (CHAT, RFNO and NREL). Two of these receptors (CHAT and RFNO) become attainment receptors based on the refined DM/NFR Severe/Moderate ozone SIP CAMx modeling, although NREL receptor remained a nonattainment receptor in the DM/NFR ozone SIP CAMx modeling (see Table 4-5 [available in full comment]). However, Utah has a 0.90 ppb ozone contribution to the NREL receptor in 2026 and, as discussed in Chapter 7, this contribution is not a statistically significant contribution to an ozone design value. This argues that Utah should also not be subject to the 2026 EGU and non-EGU controls in the Proposed Transport Rule.

5.2 Coarse Grid Resolution Will Understate Ozone Contributions due to Local Sources Resulting in

Appendix E

Overstating Utah's and Wyoming's Ozone Contribution at DM/NFR NAA Receptors

For all the reasons presented in Chapter 4 of this report, the use of the coarse 12-km grid resolution in in the Proposed Transport Rule CAMx modeling will dilute the ozone and precursor concentrations in the DM/NFR ozone NAA resulting in an understatement of modeled ozone concentrations due to local sources than if a finer grid cell size was used (e.g., 4-km). With higher modeled ozone concentrations due to local sources at receptors in the DM/NFR NAA that would increase the total MDA8 ozone concentrations and reduce the Utah and Wyoming CF resulting in reductions in Utah's and Wyoming's contribution to 2023 and 2026 ozone design values at DM/NFR NAA receptors.

Commenter: Utah Division of Air Quality

Commenter ID: 47

Docket ID: EPA-R08-OAR-2022-0315

Comment:

The UDAQ has provided extensive comments on the substantial limitations and problems with the modeling used to justify the inclusion of Utah in the proposed FIP. These limitations are significant and include inappropriate modeling resolution, inadequate modeling of atmospheric transport, significant negative modeling bias, and a likely misrepresentation of the atmospheric chemical regime as

a result of issues with the inventories used.

Response

Commenters describe the "conceptual model" of local scale meteorological conditions that are typically associated with high ozone concentrations measured in areas around Lake Michigan and in western states where the EPA has identified nonattainment and/or maintenance-only receptors in 2023. Commenters claim that the EPA's projected design values and contributions for receptors in these areas are flawed because the horizontal resolution of the EPA's modeling (i.e., 12 km) is too coarse to properly resolve the emissions and meteorological conditions that lead to locally high ozone concentrations associated with the land/water interface in coastal areas and in complex terrain. In this regard, commenters argue that EPA must use "fine scale modeling" (i.e., 4 km resolution or 1 km resolution) to properly simulate ozone concentrations and the response to emissions changes, and thus provide credible projections of design values and contributions for such areas. Commenters support their claim by pointing to model performance statistics from the EPA's modeling for 2016, which commenters say is biased low compared to the corresponding measured ozone concentrations at receptors in Coastal Connecticut, the Lake Michigan area, and in Colorado and Utah. Commenters then allege that the modeled response to emissions reductions (i.e., Relative Response Factors - RRFs) is correlated with base year model bias. That is, the commenters contend that the low-bias in the 2016 base year modeling implies that the model's response to the emissions reductions between

2016 and 2023 is also underpredicted. The commenters state that underpredicting model response results in design values in 2023 that are too high and, therefore, the projected design values *overstate* the magnitude and extent of the ozone problem in 2023. Commenters support these claims by noting that fine scale modeling performed for Colorado and the Lake Michigan area has less bias and error and produces lower projected design values compared to the EPA's 12 km modeling. The commenters then allege that the error associated with underprediction in the base year is compounded in the calculation of future year contributions such that the contribution metric values calculated by the EPA overstate the magnitude of contributions from upwind states. Finally, noting that projected design values and contributions are calculated based on the top 10 modeled concentrations days, commenters say that the EPA must discard from these calculations any days that do not meet certain model performance benchmarks.

The EPA agrees that fine-scale meteorological conditions associated with the land water interface coupled with the spatial distribution of ozone precursor emissions presents a challenge for modeling ozone formation and urban scale transport that affect monitoring sites in Coastal Connecticut and near the shoreline of Lake Michigan. The EPA also agrees that modeling for areas located in complex terrain, such as Denver and Salt Lake City present a similar challenge.

As described below, the EPA disagrees with commenter's assertion that fine scale modeling is required in order to

provide scientifically sound projections of ozone design values and contributions to assess interstate ozone transport for this action. In addition, the EPA disagrees that model performance benchmarks cited by commenters should be applied when identifying which days to use when calculating projected design values and contributions. The EPA also disagrees with the notion that the magnitude of model response is correlated with base year model bias and error such that modeling that underpredicted measured concentrations also underpredicts model response.

Regarding comments on the use of fine scale modeling with respect to model performance, as stated in the EPA's modeling guidance, the use of fine scale modeling should be considered for the purpose of identifying local control strategies that will provide for attainment of the NAAQS in such areas. The guidance goes on to say "If model response is expected to be different (and presumably more accurate) at higher resolution, then higher resolution modeling should be considered. If model response is expected to be similar at both high and low(er) resolution, then high resolution modeling may not be necessary."

To gauge the adequacy of model performance for regulatory applications, the EPA's modeling guidance recommends comparing model performance statistics from the base year model run (e.g., 2016) to model performance from other recent state-of-the-science model applications. Specifically, the EPA guidance recommends that "air agencies compare their evaluation results against similar modeling exercises to ensure that the model performance approximates the quality of other applications. Recent

literature reviews (Simon et al, 2012; Emery et al., 2017)[70],[71] summarize photochemical model performance for applications published in the peer-reviewed literature between 2006 and 2015. These reviews may serve as a resource for identifying typical model performance for state of the science modeling applications." The EPA has followed this guidance in evaluating the adequacy of model performance for the air quality modeling performed for the proposal and final transport actions.

The model performance criteria for MDA8 ozone concentrations recommended by Emery et al., are in the table below.

Table 4-5 Model Performance Criteria for MDA8 Ozone Concentrations

Metric	Criteria
Normalized Mean Bias (NMB)	≤ ± 15%
Normalized Mean Error (NME)	< 25%
Correlation Coefficient (r)	> 0.5

70. Simon et al Simon, H., Baker, K. R., Phillips, S, (2012), Compilation and interpretation of photochemical model performance statistics published between 2006 and 2012, *Atmos Environ*, 61, 124-139.

71. Emery, C., Liu, z., Russell, A.G., Odman, M.T., Yarwood, G., Kumar, N., (2017), Recommendations on Statistics and Benchmarks to Assess Photochemical Model Performance, Journal of the Air and Waste Management Association, 67:5, 582-598, doi:/10.1080/10962247.2016.1265027.

The EPA notes that the commenter's complaints were based on model performance for the 2016v2 modeling that EPA used for the proposed disapprovals. As described in the 2016v3 Emissions Modeling TSD and the Final Action AQM TSD, for this final action the EPA is using the 2016v3 platform which includes numerous updates made in response to comments on the proposal. Model performance for ozone with the 2016v3 platform is substantially improved compared to model performance with 2016v2 (see the Final Action AQM TSD for details on modeling performance for 2016v3).

In this RTC we present a comparison of model performance and projected design values at receptors in 2023 based on the EPA's 2016v3 modeling to the corresponding model performance and projected design values from fine scale modeling covering the Lake Michigan area, Coastal Connecticut, and Denver.

The tables below provide model performance statistics based on CAMx modeling performed by LADCO,[72] the New York State Department of Conservation (NYS DEC)[73] and Ramboll for the Denver Northern Front Range ozone

72. Attainment Demonstration Modeling for the 2015 Ozone National Ambient Air Quality Standard Technical Support Document. Lake Michigan Air Directors Consortium. September 21, 2022.

73. Yum, J., E. Zalewsky, Y. Tian, and K. Civerolo. Comparison of the CAMx performance of 2016 based modeling platforms at 12 km and 4 km resolution. 20th Annual CMAS Conference, November 01-05, 2021.

implementation plan[74] along with performance statistics based on the EPA's 2016v3 modeling.[75] Normalized mean bias and normalized mean error statistics are used to compare model performance from the EPA's 12 km modeling to 4 km modeling from these other model applications.[76] Note that data from LADCO and Ramboll are based on "two-way nested" modeling in which a fine-scale grid is embedded within a coarse scale regional domain during the model simulation. With this configuration, there are no independent predictions at 12 km. The NYS DEC performed independent modeling at 4 km and at 12 km. Note also that each group calculated statistics for different time periods during the ozone season. The LADCO statistics are based on days with measured ozone concentrations above 60 ppb, whereas

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74. Morris, R., T. Shah, M. Rodriguez, C-J Chien, and P. Vennam. Air Quality Technical Support Document (AQTSD) for the Denver Metro/North Front Range 2023 Severe/Moderate Ozone State Implementation Plan. Ramboll. August 2022.

75. For this analysis, the EPA leveraged existing, readily available, model performance statistics based on modeling by LADCO, the NYS DEC, and Ramboll for these receptors. In this regard, the data from these organizations may, in some cases, reflect preliminary modeling.

76. The normalized mean bias is calculated by first subtracting the modeled values from the corresponding observed values paired in space and time. Then, the sum of these differences is divided by the sum of the observed concentrations. The normalized mean error is calculated in a similar manner except that the sum of the absolute value of the differences is divided by the sum of the observations. Both normalized mean bias and normalized mean error are expressed as a percent.

the Ramboll statistics are based on data for all days. Both sets of statistics (i.e., with and without using a cut-off of 60 ppb) are available for the NYS DEC modeling. In all cases, the EPA 2016v3 model performance statistics were calculated for the same days that were used by LADCO, NYS DEC, and Ramboll for their applications. Finally, the differences in model performance and projected design values between the EPA's 12 km modeling and the 4 km modeling from LADCO, NYS DEC, and Ramboll cannot be solely attributable to differences in grid resolution. Other factors, such as differences in 2016 and 2023 emissions used in each model application also have some effects on the results. In this respect, the NYS DEC modeling may provide the most consistent comparison between 4 km and 12 km modeling since both sets of modeling relied on similar emissions inputs.

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Table 4-6 Model Performance Statistics Based on LADCO's Modeling and EPA's 2016v3 Modeling

			Statistics for April – September (Percent)			
			Normalized Mean Bias *Days Above 60 ppb*		**Normalized Mean Error *Days Above 60 ppb***	
Site ID	**State**	**Receptor**	**LADCO 4 km**	**EPA 12 km**	**LADCO 4 km**	**EPA 12 km**
170310001	IL	Alsip	-12.0	0.2	12.0	10.9
170314201	IL	Northbrook	-14.5	-3.9	14.5	10.5
170317002	IL	Evanston	-1.8	-0.9	13.8	9.6
550590019	WI	Chiwaukee	-11.1	-12.9	15.5	16.9
551010020	WI	Racine	-7.9	-10.9	14.1	15.2
551170006	WI	Sheboygan	-11.4	-11.6	11.4	13.2

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Table 4-7 Model Performance Statistics Based on NYS DEC's Modeling and EPA's 2016v3 Modeling (Percent)

			Statistics for May – June (Percent)					
			Normalized Mean Bias ***Days Above 60 ppb***			Normalized Mean Error ***Days Above 60 ppb***		
Site ID	**State**	**Receptor**	**NYS DEC 4 km**	**NYS DEC 12 km**	**EPA 12 km**	**NYS DEC 4 km**	**NYS DEC 12 km**	**EPA 12 km**
90010017	CT	Green-wich	-12.8	-6.5	-7.3	14.7	12.7	8.3
90013007	CT	Stratford	-7.5	-8.9	-1.9	9.7	15.7	13.1
90019003	CT	Westport	-12.0	-10.0	-3.8	12.2	10.7	7.9
90099002	CT	Madison	-5.0	-7.1	-3.3	7.2	8.7	7.3

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Table 4-8 Model Performance Statistics Based on NYS DEC's Modeling and EPA's 2016v3 Modeling (July-August)

			Statistics for July – August					
					Normalized Mean Bias *Days Above 60 ppb*		**Normalized Mean Error *Days Above 60 ppb***	
Site ID	**State**	**Receptor**	**NYS DEC 4 km**	**NYS DEC 12 km**	**EPA 12 km**	**NYS DEC 4 km**	**NYS DEC 12 km**	**EPA 12 km**
90010017	CT	Greenwich	-8.1	-3.3	-9.8	11.8	12.8	11.9
90013007	CT	Stratford	-9.7	-5.2	-0.3	15.6	12.2	12.4
90019003	CT	Westport	-13.0	-3.5	-0.1	17.1	13.2	12.7
90099002	CT	Madison	-7.2	-3.5	0.4	14.4	10.8	9.8

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Table 4-9 Model Performance Statistics Based on NYS DEC's Modeling and EPA's 2016v3 Modeling (May-June)

			Statistics for May - June					
			Normalized Mean Bias ***All Days (no "ppb" cut-off)***			**Normalized Mean Error** ***All Days (no "ppb" cut-off)***		
Site ID	**State**	**Receptor**	**NYS DEC 4 km**	**NYS DEC 12 km**	**EPA 12 km**	**NYS DEC 4 km**	**NYS DEC 12 km**	**EPA 12 km**
90010017	CT	Greenwich	-5.8	0.0	-0.5	12.4	13.6	12.7
90013007	CT	Stratford	-10.4	-9.2	-5.5	14.9	17.3	15.4
90019003	CT	Westport	-13.0	-5.8	-2.9	17.2	15.3	12.2
90099002	CT	Madison	-5.0	-4.2	-1.2	9.7	10.8	9.4

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Table 4-10 Model Performance Statistics Based on Ramboll's Modeling and EPA's 2016v3 Modeling

			Statistics for June 1 – August 20			
			Normalized Mean Bias *All Days (no "ppb" cut-off)*		**Normalized Mean Error *All Days (no "ppb" cut-off)***	
Site ID	**State**	**Name**	**Denver 4 km**	**EPA 12 km**	**Denver 4 km**	**EPA 12 km**
80350004	CO	Chatfield	0.1	3.8	9.2	10.1
80590006	CO	Rocky Flats	-0.4	2.1	8.8	9.4
80590011	CO	NREL	-2.0	1.8	8.6	10.7
80690011	CO	Ft Collins	-2.5	-3.0	7.8	9.2

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Comparing model performance using 12 km versus 4 km modeling does not support the commenter's contention that model performance using fine scale, 4 km modeling results in model performance superior to what is obtained with 12 km modeling, even at receptors where the magnitude of ozone concentrations are highly affected by complex meteorological conditions. The data in the above tables show that normalized mean bias and normalized mean error statistics for both the 4 km and 12 km modeling are well within the range of the performance criteria recommended by Emery et al., and endorsed by the commenters at nearly all of these receptors. At some of the receptors in Coastal Connecticut and near the shoreline of Lake Michigan there is notably less bias in the EPA's 12 km modeling compared to 4 km modeling at the same receptor. At the NREL and Ft Collins receptors in Denver, the bias with 12 km modeling and 4 km modeling are similar. At the other two receptors in Denver, model bias is less at 4 km. The results of this analysis indicate that model bias and error in the EPA's 2016v3 12 km modeling is comparable, overall, to model performance using 4 km modeling.

Regarding comments on the use of fine scale modeling with respect to projected design values, the EPA compared projected design values for 2023 from the 4 km modeling performed by LADCO, the NYS DEC, and Ramboll to the EPA's projections for 2023 based on the 2016v3 modeling. These data are provided in the tables below. The data from

LADCO and Ramboll are based on the application of the "3 x 3" approach for projecting design values. The NYS DEC provided two sets of projected design values; one set based on the "3 x 3" approach and a second set based on the "no water, except monitor grid cell" approach. To maintain consistency in this analysis, all the design values in the tables below, including the EPA's 12 km modeling, are based on the "3 x 3" approach.

The comparison of design values based on 12 km modeling to the corresponding design values based on 4 km modeling indicates that projected average DVs from the EPA 12km modeling are similar to those from the LADCO 4 km modeling and that both the LADCO and the EPA modeling identify the same set of monitors that have projected average design values that exceed the NAAQS (i.e., Chiwaukee and Sheboygan). A comparison of 12 km and 4 km design values for receptors in Coastal Connecticut shows that 3 of the 4 Connecticut receptors have lower projected 2023 average DVs in the NYC DEC 12km modeling compared to 4 km resolution. At these receptors the EPA 12 km 2023 average design values are lower than both the 4 km and 12km based NYS DEC projected average DVs at all the Connecticut receptors. Finally, comparing the 4 km Ramboll modeling to the 12 km EPA modeling for receptors in Colorado indicates that the projected average design values are very similar (within 1 ppb at 3 of the 4 receptors). The data show here refute the claims by commenters that 12 km modeling will

lead to systematically higher projected DVs compared to modeling simulations conducted at 4 km resolution which could result in a greater potential for overcontrol using 12 km modeling.

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Table 4-11 Comparison of Design Values for 2023 from LADCO's 4 km Modeling and EPA's 2016v3 Modeling

					LADCO 4 km	EPA 12 km	
Site ID	**State**	**Receptor**	**2021 DV**	**Preliminary 2022 DV**	**2023 Average DV**	**2023 Average DV**	**2023 Maximum DV**
170310001	IL	Alsip	71	72	67.5	68.2	71.9
170314201	IL	Northbrook	74	74	68.0	68.4	71.8
170317002	IL	Evanston	73	74	68.9	69.1	71.9
550590019	WI	Chiwaukee	74	75	71.6	72.0	73.0
551010020	WI	Racine	73	75	69.5	70.0	71.8
551170006	WI	Sheboygun	72	75	75.1	73.0	73.9

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Table 4-12 Comparison of Design Values for 2023 from NYS DEC's 4 km Modeling and EPA's 2016v3 Modeling

					NYS DEC 4 km	NYS DEC 12 km	EPA 12 km	
Site ID	**State**	**Receptor**	**2021 DV**	**Preliminary 2022 DV**	**2023 Average DV**	**2023 Average DV**	**2023 Average DV**	**2023 Maximum DV**
090010017	CT	Greenwich	79	77	75.2	73.9	72.0	72.6
090013007	CT	Stratford	81	81	77.1	76.0	73.3	74.2
090019003	CT	Westport	80	80	77.9	78.6	74.3	74.5
090099002	CT	Madison	82	79	73.7	72.0	71.2	73.3

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Table 4-13 Comparison of Design Values for 2023 from Ramboll's 4 km Modeling and EPA's 2016v3 Modeling

					Ramboll 4 km	EPA 12 km	
Site ID	State	Receptor	2021 DV	Preliminary 2022 DV[51]	2023 Average DV	2023 Average DV	2023 Maximum DV
80350004	CO	Chatfield	83	83	70.6	71.3	71.9
80590006	CO	Rocky Flats	81	83	70.3	72.8	73.5
80590011	CO	NREL	83	84	73.4	73.5	74.1
80690011	CO	Ft Collins	77	77	70.4	70.9	72.1

51. It should be noted that both EPA and Ramboll modeling of 2023 project ozone levels substantially lower than recent measured ozone levels at the four Colorado receptors, which are all well above the 2015 ozone NAAQS for both certified 2021 DVs and preliminary 2022 DVs.

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Regarding commenter's assertion that days with model performance outside the range of the performance criteria recommended by Emery, et al., should be removed from the data set used to calculate projected design values and contributions, the EPA finds this approach to be inconsistent with the intended use of these criteria. These benchmarks are based on model performance aggregated across multiple monitors and many days. In this respect, it is expected that even in model applications that meet these benchmarks there would be some monitor/days with model bias and error that is outside the range of the benchmarks. It is therefore not appropriate to use these benchmarks to screen individual sites or days. Specifically, in Emery, et al., the authors "do not make recommendations for model performance benchmarks for individual monitors, recognizing that the importance of model performance at a specific site is application-specific." In addition, the authors state "For ozone, we recommend calculating statistics over temporal scales of roughly 1 week (an episode), not to exceed 1 month."

Even though the EPA disagrees with commenter's assertion to "throw out" specific days at individual monitors for which model performance does not meet the criteria, out of an abundance of caution, the EPA performed a sensitivity analysis for selected receptors in which the projected 2023 design values and contributions were recalculated after removing individual days that fell outside the Emery et al., criteria for normalized mean bias and/or normalized mean error. The EPA chose receptors in

Coastal Connecticut, the Lake Michigan area, Dallas, and Denver for this analysis. The specific receptors included in this sensitivity analysis are Stratford, Connecticut, Chicago/Evanston, Illinois, Dallas/Denton, Texas, and Denver/Rocky Flats, Colorado.

In this sensitivity analysis the EPA first examined the normalized bias and normalized error on each day to determine if model performance on the days used to project design values and/or calculations fell outside the range of the criteria. Days with performance outside the range of the criteria were removed from the calculation of project design values and contributions. Next, using data for the remaining days, the EPA recalculated Relative Response Factors (RRFs) which were then applied to the 2016-centered base period average and maximum design value to re-projected the 2023 design values. The EPA then recalculated the Relative Contribution Factor for each upwind state to downwind receptor combination.

The recalculated RCFs were then applied to the recalculated 2023 average design values to calculate a new set of contribution metric values. The number of top 10 days at each receptor that were replaced with data from other days when recalculating projected design values and contributions is given in the table below. For example, at the Stratford receptor, model performance on 4 of the top 10 days used to calculate RRFs was outside the range of the criteria. The data for these days were removed. Then the concentrations on days with performance within

the range of the criteria were re-ranked to identify a new set of top 10 days. In the calculation of the average contribution metric, 5 of the original top 10 days at this receptor were replaced with data from other days.

Table 4-14 Top 10 Days Replaced After Recalculating Projected Design Values and Contributions

		Number of Original Top 10 Days Replaced in this Sensitivity Analysis	
Site ID	**Receptor**	**Recalculated Design Values**	**Recalculated Contributions**
090013007	Stratford	4	5
170317002	Evanston	7	7
481210034	Denton	0	1
080590006	Rocky Flats	0	1

The table below provides the projected 2023 average and maximum design values without the removal of any days (i.e., Final Action design values) and the recalculated 2023 design values after removing days with model performance outside the range of the criteria (i.e., days commenters claim have "poor performance"). The data in the table below indicates that there is less than a ppb difference between the two sets of design values at Stratford and Evanston even though data on nearly half (Stratford) and more than half (Evanston) of the days used to project design values were replaced with data from other days.

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Table 4-15 Final Action Design Values Versus Sensitivity Scenario Design Values

			Projected 2023 Design Values (ppb)			
			Final Action		Sensitivity	
Site ID	**State**	**Receptor**	**Average DV**	**Maximum DV**	**Average DV**	**Maximum DV**
090013007	CT	Stratford	72.9	73.8	72.1	73.0
170317002	IL	Evanston	68.5	71.3	69.2	72.0
481210034	TX	Denton Airport	69.8	71.6	69.8	71.6
080590006	CO	Rocky Flats	72.8	73.5	72.8	73.5

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The following tables provide the contribution metric values for upwind states linked to the Stratford, Connecticut, Chicago/Evanston, Illinois, Dallas/Denton, Texas, and Denver/Rocky Flats, Colorado receptors for this final action (i.e., no days removed) and the sensitivity scenario (i.e., days removed based on model performance). The highlighted contributions in these tables identify contributions that exceed the 1 percent of the NAAQS screening threshold. The data indicate that removing days with "poor performance" does not appear to result in any systematic bias in the magnitude of contributions. That is, contributions increase for some states linked to a particular receptor while contributions from other upwind states linked to that same receptor decrease. For example, at Evanston the contribution from Wisconsin dropped by 50 percent, whereas the contribution from Arkansas nearly doubled to a level above the screening threshold. In addition, after removing days with "poor performance" the contribution from Louisiana increased to above the threshold. Although the contribution from Michigan to Stratford dropped to below the screening threshold after removing days with "poor performance", the contribution from this state to Evanston more than doubled. Also, although Illinois contributes below the threshold to Stratford after removing days with "poor performance", Illinois contributes well above the threshold to receptors in Wisconsin. The results of this sensitivity analysis indicate that the EPA's findings in this final action are robust with respect to consideration of daily model performance at individual monitoring sites.

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Table 4-16 Sensitivity Analysis - Stratford, CT Receptor

Upwind State	Stratford, CT (090013007)	
	2023 Contribution (ppb)	
	Final Action	Sensitivity
IL	**0.72**	0.50
IN	**1.18**	**0.74**
KY	**0.80**	**0.84**
MD	**0.96**	**1.12**
MI	**1.38**	0.48
NJ	**7.22**	**7.94**
NY	**12.70**	**12.66**
OH	**2.04**	**1.79**
PA	**5.43**	**6.62**
VA	**1.15**	**1.25**
WV	**1.35**	**1.68**

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Table 4-17 Sensitivity Analysis - Evanston, IL Receptor

Upwind State	Evanston, IL (170317002)	
	2023 Contribution (ppb)	
	Final Action	Sensitivity
AR	0.46	**0.88**
IN	**6.40**	**7.01**
LA	0.14	**0.70**
MI	**1.11**	**2.50**
MO	**1.18**	**1.04**
OH	**0.96**	**1.49**
TX	**1.85**	**0.86**
WI	**2.32**	**1.17**

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Table 4-18 Sensitivity Analysis - Denton Airport, TX Receptor

Upwind State	Denton Airport, TX (481210034)	
	2023 Contribution (ppb)	
	Final Action	Sensitivity
AR	**0.92**	**0.89**
LA	**2.87**	**2.68**
MS	**0.91**	**0.85**
OK	**1.01**	**1.09**

Table 4-19 Sensitivity Analysis - Rocky Flats, CO Receptor

Upwind State	Rocky Flats, CO (080590006)	
	2023 Contribution (ppb)	
	Final Action	Sensitivity
CA	**1.44**	**1.15**
UT	**1.17**	**1.12**

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Finally, in response to comments that claim at the EPA's projected design values used to identify receptors are too high as a result of base year model underprediction, the EPA conducted an analysis to determine if there is any clear relationship between base year (i.e., 2016) model bias and the response of the EPA's CAMx modeling to emissions changes between 2016 and 2023. The figures below show model bias on individual days as a function of model response on the days at the Chicago/Evanston, Denver/Rocky Flats, and Dallas/Denton receptors. The plots are based on days with modeled MDA8 ozone concentrations greater than or equal to 60 ppb in the set of grid cells used to project 2023 design values. As evident from these plots, there is no discernable relationship between model bias and model response. Thus, base year model under prediction of measured data does not translate into an under prediction of model response and an over prediction of projected design values.

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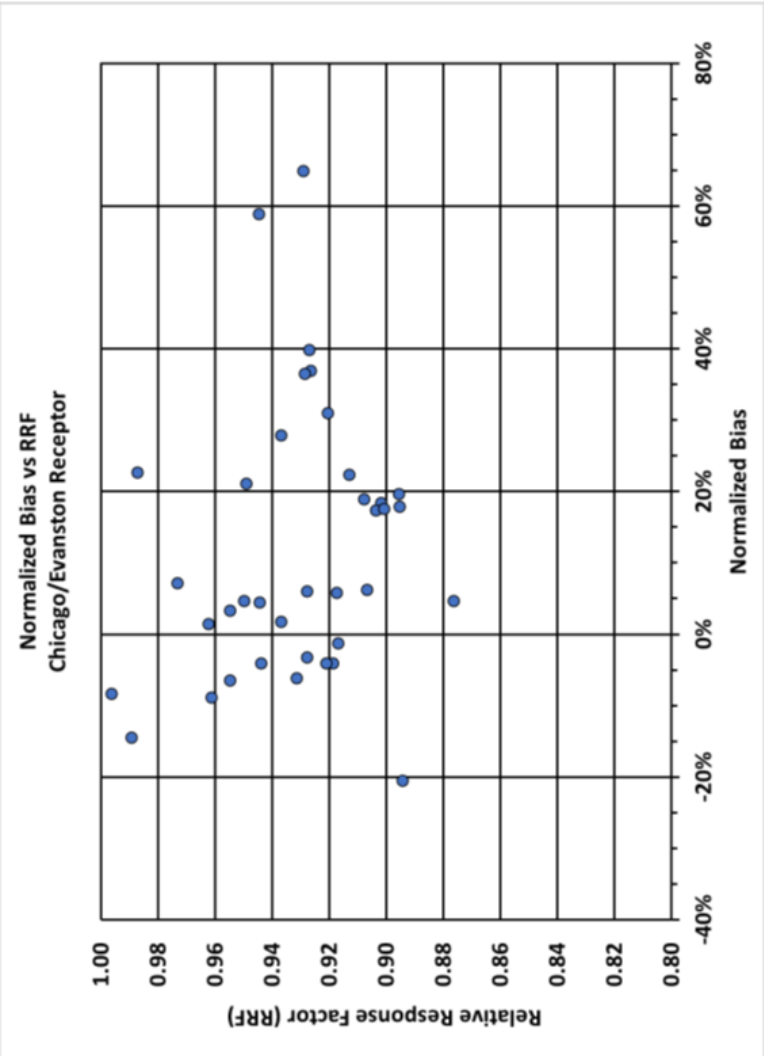

Figure 4-9

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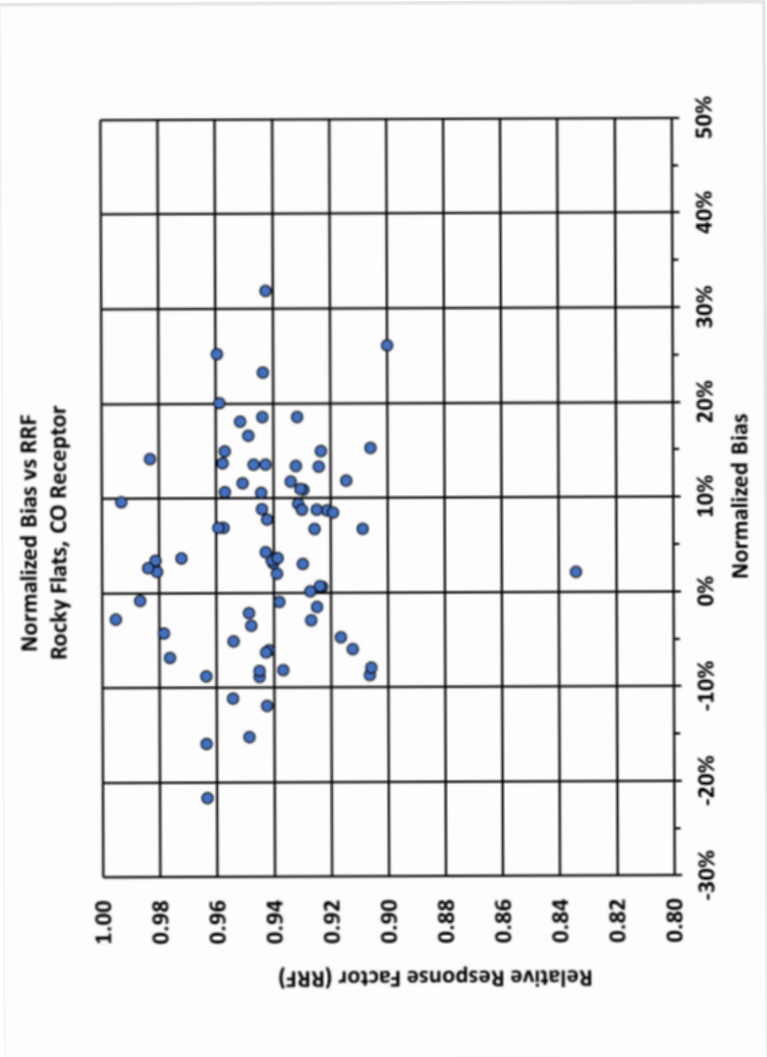

Figure 4-10

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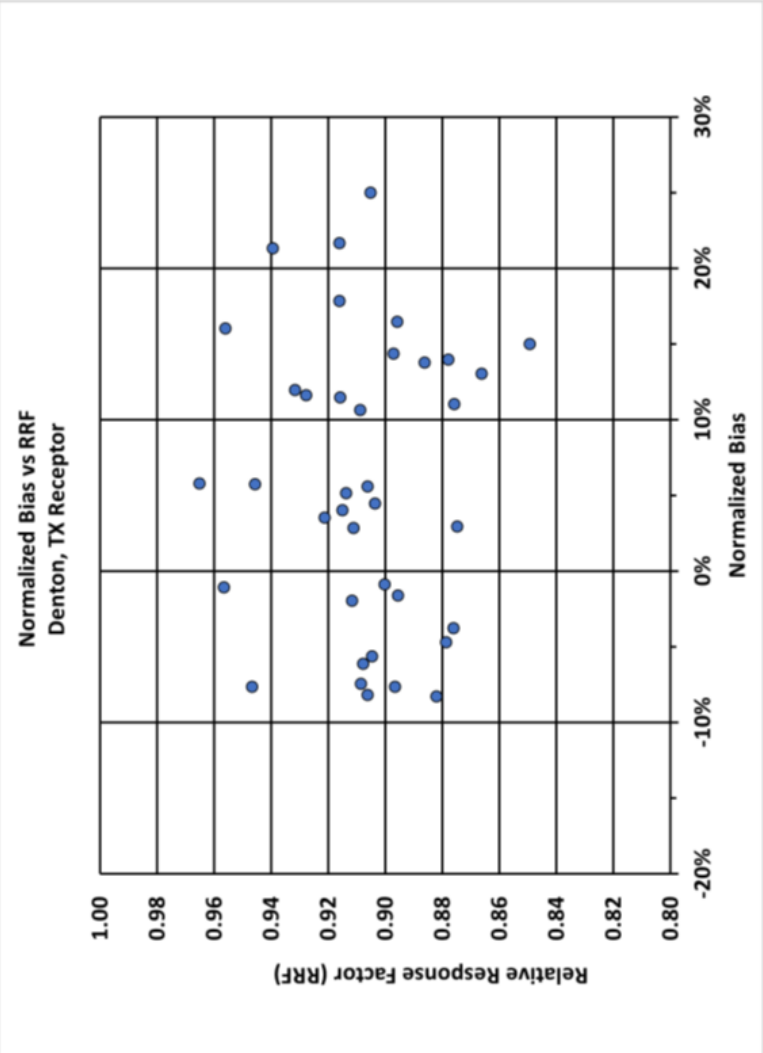

Figure 4-11

Appendix E

Comments on the proposed FIP are out of the scope of this action. Other topics raised by these comments are addressed in the following sections: 11.4 (Transport Policy—Western State Ozone Regulation).

* * *

Commenter: United States Steel Corporation

Commenter ID: 45

Docket ID: EPA-R05-OAR-2022-0006

Comment:

<u>One Percent Contribution Criterion is Not Appropriate as it is Lower than What U.S. EPA Advised States and it is Lower Than What Can be Supported Based on the Precision of the Modeling</u>

U. S. Steel notes that while U.S. EPA may believe the modeling used to support its disapproval of the SIPs is accurate and precise, the accuracy and precision of the modeling does not support an impact threshold of 0.70 ppb. U.S. EPA needs to consider the accuracy and the precision of the modeling when determining an appropriate "interference" threshold. U. S. Steel acknowledges that a model cannot necessarily be "perfect" as U. S. EPA points out, but the U.S. EPA's decisions and impacts to the regulated need to reflect the model's accuracy and precision.

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Commenter: Utah Petroleum Association and the Utah Mining Association

Commenter ID: 48

Docket ID: EPA-R08-OAR-2022-0315

Comment:

EPA should not apply the same downwind threshold contribution in the western United States that it applies in the east.

EPA judged the Utah IT SIP based on a threshold contribution of 0.7 ppb to downwind States, but numerous other influences affect ozone in the west, meaning that such a small contribution can be difficult to predict with any accuracy. In their comments on the Proposed GNR, the Western States Air Resources Council ("WESTAR") stated:

> Air quality in the WESTAR region is influenced by both human activities and natural phenomena. Baseline air quality and the sources of impacts to that baseline differ based on local industry, geography, population, meteorology, and other state or regional conditions. Across the West, high elevations, extreme variations in topography, vast landscapes, and variable weather patterns influence air quality. The West is also disproportionately affected by wildfires, high wind dust events, volcanic activity, and

> international transport of pollutants. Pollutant sources, methods of dispersion, and types of affected areas in the West are quite different from those in the eastern United States.

While EPA strives for consistency, being consistent does not always mean being the same. The differentiating factors in the WESTAR comments must be considered. At a minimum, these factors point to greater uncertainty in air quality modeling. Considering the myriad of factors lending uncertainty to modeling results, the 0.7 ppb threshold contribution is too low.

Response

The EPA responds to these comments in the preamble in Section V.B. Specifically, comments regarding the technical merits and justification of a 1 percent of the NAAQS contribution threshold are addressed in Section V.B.4. and Section V.B.5. of the preamble, respectively. Comments advocating use of the Prevention of Significant Deterioration Significant Impact Level as the contribution threshold at Step 2 are addressed in Section V.B.6. of the preamble.

As the EPA recognized when it first applied this threshold in CSAPR, using a threshold expressed as a percentage of the NAAQS allows for the threshold to become more stringent in proportion to the increased protectiveness of public health and the environment when the EPA revises the NAAQS. 76 FR 48208, 48238 (Aug. 8, 2011) (The

"approach is readily applicable to any current and future NAAQS and would automatically adjust the stringency of the transport threshold to maintain a constant relationship with the stringency of the relevant NAAQS as they are revised."). No state or commenter has explained why this well-considered policy is unlawful or arbitrary and capricious.

One commenter pointed to the EPA's proposed error correction of the EPA's prior approval of Delaware's SIP submission in a separate rulemaking proceeding to argue that updates to modeling make the threshold too small, as a states' contribution can change to be above or below a 1 percent of the NAAQS contribution threshold after updates are made to the modeling. But the same would be true for any threshold, including 1 ppb. Some states that would fall just above a 1 ppb threshold could be anticipated to make (and indeed, several included in this action do make) virtually identical arguments as the states that are just over the 1 percent of the NAAQS threshold.

Additionally, in the case of every state covered by this action, with the exception of Alabama, Kentucky, and Minnesota, the difference between a 1 percent threshold and a 1 ppb threshold is irrelevant to the decision here because linkages are present above the 1 ppb level in the 2016v3 modeling.

Another commenter argued that 1 percent of the NAAQS fails limits of modeling and monitoring capability and so violates the requirement from *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2012) for EPA to establish a "measurable contribution" before identifying the amount of "significant contribution." *Michigan*, 231 F.3d at 684. Another commenter apparently references Table B-1 to subpart B of 40 CFR Part 53 (performance limit specifications for automated methods), to make a similar argument regarding the capabilities of monitoring equipment. We address the comments on whether monitoring technology accuracy is relevant in Section V.B.4 of the preamble. There is also no conflict with *Michigan*. Contributions as low as 1 percent of the NAAQS (and impacts at even lower levels) are reliably measured through our modeling to calculating and apportioning contribution.

Other issues raised by these comments are addressed in the preamble in Sections V.A.4., V.B.2., V.B.6., V.B.7., and V.C.2. and in the following sections: Sections 1.2 (Guidance for SIP Submissions), 1.4 (Use of Updated Modeling), 4.2 (Model Performance), 5 (Updates to Modeling and Changes in Linkages), 7.2 (August 2018 Memorandum), 9.2 (Over-Control), 10.3 (Cooperative Federalism and the EPA's Authority), 11.4 (Transport Policy – Western State Ozone Regulation), and 11.5 (International Contributions). Further explanation of the EPA's contribution calculation can be found in the Final Action Air Quality Modeling TSD, in the docket for this action.

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Appendix E

Commenter: West Virginia Department of Environmental Protection

Commenter ID: 49

Docket ID: EPA-R03-OAR-2021-0873

Comment:

DAQ also asserts EPA is inconsistent with its definition of screening threshold impacts in relation to downwind receptor (monitor) linkage. In an August 31, 2018 memorandum from OAQPS Director Peter Tsirigotis to regional air divisions directors titled Analysis of Contribution Thresholds for Use in Clean air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards ("Threshold Memorandum"), EPA compared alternative thresholds of 1 and 2 ppb (0.001 and 0.002 ppm, respectively) to be consistent with previous thresholds of one percent of the 2015 ozone NAAQS standard (1% of 70 ppb, equal to 7 ppb or 0.0007 ppm) for the purposes of screening threshold for SIP development. EPA stated within the Threshold Memorandum, "Based on the data and analysis summarized here, the EPA believes that a threshold of 1 ppb may be appropriate for states to use to develop SIP revisions addressing the good neighbor provisions for the 2015 ozone NAAQS." In this proposed disapproval action, it appears EPA has abandoned these alternatives in favor of the one percent definition.

Appendix E

Response

Our primary response to these comments is in Section V.B.7 of the preamble. Here we address in more detail several specific arguments raised by commenters.

The EPA disagrees with some commenters' assertion that the EPA's proposed approval of Iowa's SIP submission is proof the EPA previously viewed the 1 ppb alternative threshold was "adequate and approvable" in all instances, but subsequently changed position. As the EPA explained at proposal, the first proposal for Iowa specifically examined "state-specific circumstances" as contemplated by the August 2018 Memorandum. *See*, *e.g.*, 87 FR 66418 (citing 87 FR 9477 (Feb. 22, 2022)) Even if the EPA had finalized the Iowa approval on the basis of the first proposal, doing so would have been specific to Iowa's state-specific circumstances. The EPA evaluated each interstate transport SIP submission based on the merits of the arguments put forward in each SIP submission. However, in all submissions that relied on the EPA's August 2018 memo—where that threshold would have been a dispositive basis to exclude the state from further analysis—the EPA determined the submissions did not provide the EPA with analysis specific to their state or the receptors to which its emissions are potentially linked. This is true even for Iowa's submission, as explained at proposal. *See*, *e.g.*, 87 FR 64418.

Other topics raised by these comments are addressed in the preamble in Sections V.A.4. (technical merits), V.A.5. (justification), V.A.6. (guidance), V.B.6. (PSD SILs), V.B.7.

(basis for approval of Iowa's SIP), and in the following sections: Sections 1.2 (Guidance for SIP Submissions), 1.4 (Use of Updated Modeling), 1.6 (EPA Input During SIP Submission Development), 4.2 (Model Performance), 5 (Updates to Modeling and Changes in Linkages), 7.2 (Contributions), 10.3 (Cooperative Federalism and the EPA's Authority), 11.3 (Transport Policy), and 11.8 (Mobile Sources).

The EPA responds to specific issues raised by commenters about the appropriateness of an alternative contribution threshold for specific states:

Alabama

Alabama did not provide a sufficient technical analysis to justify the use of an alternative 1 ppb threshold in its submission. 87 FR 64423-25. Alabama's SIP submission simply states that ADEM agrees with EPA's rationale set out in the August 2018 memorandum that the amount of upwind collective contribution captured with the 1 percent and 1 ppb thresholds was generally comparable. But the August 2018 Memorandum anticipated that states would evaluate whether the alternative threshold was appropriate under their specific facts and circumstances, not that the use of the alternative threshold would be automatically approvable.

ADEM and Alabama Power Company (APC) et al. claim that 1 ppb is an appropriate contribution threshold to use for Alabama and conduct an assessment fashioned to emulate the EPA's assessment in the now withdrawn

proposal related to Iowa. Concluding that 1 ppb is generally similar to 1 percent, they next examine the factors that the EPA considered in the now withdrawn proposal related to Iowa to conclude that 1 ppb is an appropriate contribution threshold for Alabama.

The EPA does not agree that this assessment justifies the use of a 1 ppb contribution threshold for Alabama. As an initial matter, ADEM did not supply anything like this analysis in their SIP submission. This highlights the potential unfairness we identified as a policy concern at proposal, in that allowing some states to attempt to justify alternative thresholds could result in inconsistent treatment of states based on the quality of the analysis they conducted. Further, as EPA explained at proposal, there is an administrative cost to public agencies, including the EPA, in going through the burden of conducting this type of analysis for each state, or for each set of comments on SIP actions, where the difference being evaluated is merely between a 1% and 1 ppb threshold, and the objective of using 1 ppb for certain states and sources is to excuse themselves from further analysis, thus shifting the burden of addressing interstate transport onto other upwind states and the downwind home state. Further, although commenter attempts to replicate the *proposal* analysis for Iowa, we never finalized that analysis and withdrew it. The factors in that analysis do not constitute a final agency policy or precedent on how a state-specific, 1 ppb-threshold analysis should be conducted. At proposal for this state's disapproval and others included in this action, we explained that we would not be undertaking this analysis where states failed to conduct it themselves.

All of that said, we further conclude that these comments still fail, even under the terms of the Iowa-proposal factors, to justify the use of a 1 ppb threshold for Alabama. Alabama's contribution alone at the Denton County (Airport) and Harris County (Houston Bayland Park) receptors in Texas in the 2016v2 modeling represents about 6 and 7 percent respectively of the total upwind state contribution at either monitor. Further, the loss in capture of total upwind-state contribution at 1 ppb versus 1 percent at these receptors is not trivial and well exceeds the ~7% losses contemplated in the August 2018 memorandum. For example, as noted by these comments, two other states are identified with contribution to the Denton County, TX receptor between 1 percent of NAAQS and 1 ppb. If we were to approve a 1 ppb threshold, one of those state's contributions would go unaddressed as well (Tennessee), constituting a loss, when in addition to Alabama's, of about 18 percent of the upwind state contribution over 1 percent at this receptor. That value is more than twice the 7% loss of upwind contribution figure that was identified as *potentially* acceptable in the August 2018 memorandum. Further, the treatment of Arkansas in this analysis would discount the loss of its contribution to this receptor, solely on the basis of its linkage above 1 ppb to other receptors—the idea being that if Arkansas were required to make emissions reductions in relation to those receptors, then it might incidentally benefit this receptor. While the EPA proposed to consider contribution in this way in the Iowa proposal, this is actually not consistent with the way EPA has considered the relevance of incidental effects in prior transport actions such as CSAPR Update and the Revised CSAPR Update. Reliance on such incidental

effects introduces an inequitable situation in which states may be able to evade good neighbor obligations in reliance on the incidental effects of other states' efforts. *See* 81 FR at 74550. The EPA cannot agree that it is appropriate to treat Arkansas' contribution to this receptor as irrelevant simply because it contributes above 1 ppb to other receptors. If Arkansas's contribution were to be included in this analysis, then the total loss of contribution at the Denton receptor (using 2016v2) is actually on the order of 25 percent of total upwind state contribution.

Turning to the 2016v3 modeling used for this final action, these results are reinforced. In the 2016v3 modeling Alabama is linked in 2023 to the modeling-based receptor in Galveston, Texas. The total collective contribution from all upwind states is 26 percent of total ozone at this receptor. Of the 5 upwind states linked to this receptor, 3 contribute between 1 percent and 1 ppb. Using a 1 ppb threshold would represent a loss of about 19 percent of the total upwind contribution above 1 percent. In addition, Alabama's contribution to this receptor represents 30 percent of the total contribution that would be lost using a 1 ppb threshold. In addition, in our final rule analysis we note that Alabama is also linked to the Pilot Point violating-monitor maintenance-only receptor in Denton County, Texas at which the collective contribution from upwind states is 18 percent of the total ozone at this receptor in 2023. Of the 6 upwind states linked to this receptor, 4 contribute between 1 percent and 1 ppb. Using a 1 ppb threshold would represent a loss of about 41 percent of the total upwind contribution above 1 percent at the Denton Pilot Point receptor. In addition, Alabama's

contribution to this receptor represents 25 percent of the total contribution that would be lost using a 1 ppb threshold.

As we explain in the proposals and in the preamble of the final action, interstate ozone transport remains a collective-contribution problem involving many smaller contributors, and so the effect of approving a 1 ppb threshold needs to be reviewed for its holistic impacts. In this case, we do not find that the record would support approving a 1 ppb threshold for Alabama, even if we were to apply the factors used in the withdrawn Iowa proposal. ADEM observes that "it is unclear how lower NOx emissions in the 2022 modeling resulted in higher concentrations relative to the 2021 modeling" despite "continued reductions in NOx." If ADEM meant to question the validity of EPA's modeling with this statement, the EPA responds to comments on model performance in Section 4.2. If ADEM meant to say "contributions" instead of "concentrations," the EPA addresses a similar comment in Section 7.2. In response to the claim that EPA ignored evidence in the record when evaluating Alabama's SIP submission, specifically APC's comments submitted on the draft SIP submission during the state's public notice and comment period, which were included as attachment to Alabama's submission, the EPA disagrees. As noted in the proposal, Alabama did not explicitly discuss the comments it received during their state public comment period from Alabama Power Company and Sierra Club; Alabama only identified one specific assertion from their state public comment period as part of their response to public comments. Additionally, because SIP submissions are required to include a

compilation of public comments received, it is not notable that these comment letters were attached to Alabama's SIP submission. 40 CFR Part 51, Appx V, 2.1(h). Thus, the EPA determined that Alabama's June 21, 2022, SIP submission did not rely on the legal, technical, or policy arguments provided in comments except as expressly stated by Alabama. In their own comment on this action, Alabama did not indicate that the EPA's assumption of Alabama's intention regarding the purpose of the inclusion of the comments from Alabama Power Company and Sierra Club on the submission was incorrect. *See* EPA-R04-OAR-2021-0841-0033. It remains unclear what the state's view is of and whether and to what extent the comments from APC and Sierra Club constitute an expression of the state's own position on its submission. Therefore, the EPA believes that the commenter is mistaken that the APC and Sierra Club comments received during the state's public comment process were explicitly embraced by Alabama as part of the state's SIP submission package. The EPA evaluated the information the state put forth in the SIP submission package and those specific arguments the state specifically acknowledged as part of their final SIP submission package.

Arkansas

One commenter argues that Arkansas provided sufficient analysis in the state's SIP submission to justify a conclusion that a 1 ppb contribution threshold is appropriate for the state. The EPA disagrees. The EPA's August 2018 memorandum explained that a 1 ppb contribution

threshold "may" be appropriate,[70] and that "air agencies should consider whether the recommendations in this guidance are appropriate for each situation."[71] Arkansas did not do that. In the SIP submission, Arkansas Division of Environmental Quality (ADEQ) (1) concluded based on the EPA's nationwide collective contribution comparison of different thresholds in the August 2018 memorandum that 1 percent and 1 ppb are generally comparable, (2) asserted that the prevention of significant deterioration significant impact level are sufficiently analogous to Step 2 of the 4-step interstate transport framework to support 1 ppb, and (3) concluded that 40 CFR part 50, Appendix U supports truncating to 0 a value of 0.7 ppb (1 percent of the NAAQS). 87 FR 9798, 9804 (Feb. 22, 2022). Arkansas identified it contributed more than 1 percent of the NAAQS but less than 1 ppb to three receptors in Texas, 87 FR 9804, but none of its justifications for a 1 ppb contribution threshold were related to those receptors or Arkansas's contributions to them. The EPA is unpersuaded that any of Arkansas's arguments supported a conclusion that a 1 ppb threshold is appropriate for Arkansas. In response to Arkansas Environmental Federation's comment that EPA cannot disapprove a SIP submission on the basis of a state's use of alternate contribution threshold, the EPA notes that Arkansas's SIP submission identified Arkansas as contributing more than 1 ppb to one or more downwind receptors. 87 FR 9798, 9804 (Feb. 22, 2022). Thus, the difference between a 1 percent of the NAAQS threshold and a 1 ppb threshold is not meaningful to the conclusion

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[70] August 2018 memorandum, page 4.

[71] August 2018 memorandum, page 1.

that Arkansas is linked at Step 2, because Arkansas contributes more than 1 ppb to a downwind receptor in 2023 both in the modeling relied on by the state and in the additional modeling developed by EPA to inform both the proposed and final actions (2016v2 and 2016v3).

Kentucky

The EPA disagrees with Kentucky Division for Air Quality that Kentucky followed the August 2018 Memorandum. Kentucky identified that it contributed more than 1 percent of the NAAQS but less than 1 ppb to four receptors in Connecticut and Wisconsin (and more than 1 ppb to one receptor in Maryland), 87 FR 9504. Kentucky simply applied EPA's rationale presented in the August 2018 memorandum (i.e., that the amount of *nationwide* upwind collective contribution captured with the 1 percent and 1 ppb thresholds was generally comparable) without discussion or analysis specific to Kentucky or the receptors in Connecticut and Wisconsin, as anticipated in the August 2018 memorandum.[72] 87 FR 9509- 9510. Given the absence of technical analysis to support the use of a 1 ppb threshold under the facts and circumstances relevant to Kentucky and its linked receptors, the EPA determines that Kentucky's submission does not provide a sufficient justification to support the use of a 1 ppb contribution threshold.

[72] *Id.* ("air agencies should consider whether the recommendations in this guidance are appropriate for each situation.")

Appendix E

Louisiana

A commenter argues that a 1 ppb contribution threshold is appropriate for Louisiana, regardless of Louisiana's contributions of more than 1 percent of the NAAQS but less than 1 ppb to Milwaukee, Sheboygan, and Allegan because the contribution captured with the 1 ppb threshold at those sites would be 83.0%, 91.8%, and 94.2%, respectively. The EPA notes that Louisiana did not provide that information in its submission, and in the 2016v3 modeling for this final action, Louisiana is linked to 7 receptors in Texas, but is not linked to Milwaukee, Sheboygan, or Allegan in this updated modeling. However, the EPA disagrees with commenters that Louisiana's SIP submission supports a conclusion that a 1 ppb threshold is an appropriate contribution threshold for Louisiana for any receptor, because Louisiana's justification is flawed. The EPA's August 2018 memorandum explained that a 1 ppb contribution threshold "may" be appropriate,[73] and that "air agencies should consider whether the recommendations in this guidance are appropriate for each situation."[74] LDEQ's SIP submission attempted to justify the state's use of a 1 ppb threshold based on concerns over the use of a 1 percent threshold, namely alleging that it is an arbitrarily small value. *See* 87 FR 9798, 9811 (Feb. 22, 2022). In the EPA's view, a criticism of a threshold of 1 percent of the NAAQS does not constitute a state-specific justification for the use of an alternative contribution threshold. We have responded

[73] August 2018 memorandum, page 4.

[74] August 2018 memorandum, page 1.

to various criticisms of the 1 percent threshold in Sections V.B.4.-V.B.7 of the preamble. Further, in the SIP submission, LDEQ identified Louisiana as contributing more than 1 ppb to one or more downwind receptors and so conceded Louisiana is linked at Step 2 in Louisiana's SIP submission. The difference between a 1 percent of the NAAQS threshold and a 1 ppb threshold is not meaningful to the conclusion that Louisiana is linked at Step 2 because Louisiana contributes more than 1 ppb to a downwind receptor both in the modeling relied on by the state and in the modeling relied on by EPA in this final action.

Oklahoma

The EPA disagrees with Oklahoma Department of Environmental Quality that Oklahoma's rationale for supporting the use of a 1 ppb contribution threshold is justified under the text of the August 2018 memorandum. The EPA's August 2018 memorandum explained that a 1 ppb contribution threshold "may" be appropriate,[75] and that "air agencies should consider whether the recommendations in this guidance are appropriate for each situation."[76] Oklahoma did not do that.

In its SIP submission, Oklahoma identified that the state contributed more than 1 percent of the NAAQS but less than 1 ppb to three receptors in Texas and Wisconsin. 87 FR 9817. Instead of considering whether a 1 ppb contribution threshold would be appropriate for

[75] August 2018 memorandum, page 4.

[76] August 2018 memorandum, page 1.

Oklahoma as to these specific receptors, Oklahoma's SIP submission pointed to the EPA's PSD SILs Guidance. The EPA addresses comment related to the PSD SILs guidance in Section V.B.6. of the preamble. The EPA also does not agree with the blanket statement in the comment that the August 2018 memorandum supports a conclusion that 1 ppb contribution is appropriate for any state with "low contributions." Somewhat similar issues regarding Oklahoma are addressed in Section 11.3.

Tennessee

The EPA is not taking final action on Tennessee's submission at this time.

One commenter suggests that because Tennessee is linked to a single maintenance-only monitor in a single state above one percent compared to other upwind states linked to multiple nonattainment and maintenance receptors, this supports the consideration of a 1 ppb alternative threshold. To the extent this may be considered an issue more broadly relevant than just to Tennessee, EPA disagrees with the commenter's assumption that an upwind state's number of downwind linkages justifies an alternative threshold. Tennessee's analysis of the number of upwind linkages does not provide evidence that a 1 ppb threshold would effectively capture an appropriate degree of upwind-state collective contribution, even if only to a single identified downwind receptor. The commenter also asserts that Tennessee's contribution to a downwind maintenance-only receptor is sufficiently marginal that an alternative threshold of 1 ppb should

be considered. The EPA notes that the commenter does not clarify their definition of a marginal contribution in the context of a collective contribution problem, or why 1 ppb appropriately excludes "marginal" contribution in some way that 1 percent does not—indeed, as explained in Section V.B.7, while 1 ppb may be considered "similar" to 1 percent, it still causes some loss of upwind contribution from further analysis for elimination and in that respect would reflect a weakening of the Step 2 threshold for the more protective 2015 ozone NAAQS. No commenter has explained why this incongruity is an acceptable outcome in light of the purpose of the statute.

Utah

The EPA disagrees that Utah's SIP submission justified the use of a 1 ppb threshold pursuant to the August 2018 Memorandum. The EPA reviewed the analysis UDAQ provided in its SIP submission and concluded that UDAQ did not adequately explain how a 1 ppb threshold would be justified with respect to Denver area receptors, as explained at proposal. 87 FR 31478. The difference between a 1 percent of the NAAQS threshold and a 1 ppb threshold is not meaningful to the conclusion that Utah is linked at Step 2, because Utah identified it contributes more than 1 ppb to four downwind receptors. Utah is also projected to contribute more than 1 ppb to one or more downwind receptors in the updated modeling developed by EPA to inform both the proposed and final actions (2016v2 and 2016v3).

Appendix E

The EPA does not agree that the recommendation it made in reviewing a pre-submission version of Utah's SIP submission, that UDAQ review the August 2018 memorandum, can reasonably be construed as an endorsement of the appropriateness of the 1 ppb threshold for the state of Utah.

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Appendix E

Commenter: United States Steel Corporation

Commenter ID: 45

Docket ID: EPA-R05-OAR-2022-0006

Comment:

Judicial Review of Any Disapproved SIP Belongs in the Appropriate Circuit Court for the State

The disapproval of the individual SIPs does not have nationwide effect regardless how U.S. EPA attempts to characterize its proposed action. If finalized as proposed, the rule would result in the disapproval of SIPs for Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. Each SIP has individual, unique sources, and unique air quality aspects. The SIP submittals are unique to each State. Each state has different types of sources. The issues are unique to each State. The impacts of disapproving these State SIPs are local and regional to the affected states and industries in those states. While U.S. EPA may prefer to have a "one size fits all" approach in developing a FIP to replace these SIPs; this does not change the fact that Congress gave States primary responsibility to adopt State Implementation Plans. The individual State submittals are unique to the individual State and sources; and disapproval of any SIP is presumably unique to the individual State.

Appendix E

Response

CAA section 307(b)(1) establishes two routes by which venue may be proper in the D.C. Circuit. First, the D.C. Circuit is "the exclusive venue when EPA's challenged action is 'nationally applicable' rather than 'locally or regionally applicable.'" *Sierra Club v. EPA*, 47 F.4th 738, 742-43 (D.C. Cir. 2022). "Second, and alternatively, venue also lies exclusively in [the D.C. Circuit] if an otherwise 'locally or regionally applicable' action 'is based on a determination of nationwide scope or effect' and EPA 'finds and publishes that such action is based on such a determination.'" *Id.* at 743. For the reasons provided below, this final action is nationally applicable. Alternatively, if a court finds this action to be locally or regionally applicable, the Administrator is exercising his complete discretion to find and publish that this action is based on a determination of nationwide scope or effect.

Nationally Applicable

To determine whether an action is "nationally applicable" or "locally or regionally applicable," a court "'look[s] only to the face of the agency action, not its practical effects.'" *Chevron U.S.A. Inc. v. EPA*, 45 F.4th 380, 386 (D.C. Cir. 2022) (quoting *Sierra Club*, 926 F.3d 844, 849). Venue turns on the nature of the agency "action," not the nature of a petitioner's challenge. *ATK Launch Systems, Inc. v. EPA*, 651 F.3d 1194, 1197 (10th Cir. 2011) (holding that "this court must analyze whether the regulation itself is nationally applicable, not whether the effects complained of or the petitioner's challenge to that regulation is nationally applicable"); *Texas v. EPA*, 829 F.3d 405, 419 (5th Cir. 2016)

("The question of applicability turns on the legal impact of the action as a whole"); *S. Ill. Power Coop. v. EPA*, 863 F.3d 666, 670 (7th Cir. 2017). On its face, this final rulemaking is "nationally applicable" because it directly applies to 21 states located in ten federal judicial circuits and in eight EPA regions across the entire continental United States.

Specifically, in this action the EPA is disapproving the good neighbor SIPs submitted by Alabama, Arkansas, California, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Jersey, New York, Ohio, Oklahoma, Texas, Utah, West Virginia, and Wisconsin based on a uniform legal interpretation and common, nationwide analytical methods with respect to the requirements of CAA section 110(a)(2)(D)(i)(I) concerning interstate transport of pollution (i.e., the EPA's 4-step interstate ozone transport framework for the 2015 ozone NAAQS). This disapproval is based on the EPA's conclusion that the good neighbor SIPs submitted by all of these states fail to contain adequate provisions to prohibit, consistent with the provisions of title I of the CAA, any source or other type of emissions activity within each state from emitting any air pollutant in amounts that will contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to the 2015 ozone NAAQS, as required by CAA section 110(a)(2)(D)(i). The immediate legal effect of this disapproval is that the EPA is now obligated under CAA section 110(c)(1) to promulgate one or more Federal implementation plans (FIPs) that satisfy the requirements of CAA section 110(a)(2)(D)(i) for the 2015 ozone NAAQS for all of these states.

The EPA is relying on the results from nationwide photochemical grid modeling using a 2016 base year and 2023 projection year as the primary basis for its assessment of air quality conditions and pollution contribution levels at Step 1 and Step 2 of the EPA's 4-step interstate transport framework and applying a nationally uniform approach to the identification of nonattainment and maintenance receptors across the entire geographic area covered by this final action. The EPA has also evaluated each state's arguments for the use of alternative approaches or alternative sets of data with an eye to ensuring national consistency and avoiding inconsistent or inequitable results among upwind states (i.e., those states for which good neighbor obligations are being evaluated in this action) and between upwind and downwind states (i.e., those states that contain receptors signifying ozone nonattainment or maintenance problems). Given that on its face this action addresses implementation of the good neighbor requirements of CAA section 110(a)(2)(D)(i)(I) in a large number of states located across the country and given the interdependent nature of interstate pollution transport and the common core of knowledge and analysis involved in evaluating the SIP submissions, this is a "nationally applicable" action within the meaning of CAA section 307(b)(1). This action derives from the EPA's "national interpretation" of CAA section 110(a)(2)(D)(i) and "any challenge thereto belongs in the D.C. Circuit." *ATK Launch Systems, Inc. v. EPA*, 651 F.3d 1194, 1200 (10th Cir. 2011).

The EPA disagrees with commenters' suggestion that all the EPA actions on implementation plans must be "locally

or regionally applicable" actions subject to review in the regional circuit courts. Commenters correctly note that in *Am. Rd. & Transp. Builders Ass'n v. EPA*, 705 F.3d 453 (D.C. Cir. 2013) (hereafter *ARTBA*), the D.C. Circuit stated that "EPA's 'action in approving or promulgating any implementation plan' is the prototypical 'locally or regionally applicable action' that may be challenged only in the appropriate regional court of appeals." 705 F.3d at 455. But that case involved the EPA's approval of a SIP submission from a single state. The court in *ARTBA* did not state that *every* EPA action on an implementation plan under CAA section 110 must be a "locally or regionally applicable action," nor did the court's venue decision address any SIP action beyond the one before the court – i.e., the EPA's approval of a particular SIP submission from California. To the extent commenters intended to cite *ARTBA* for the proposition that the regional circuit courts are the exclusive venue for any challenge to any EPA "action in approving or promulgating any implementation plan under [CAA section 110]," that claim is incorrect and unsupported by the statutory text. We note that although the Administrator's promulgation of Federal implementation plans under section 110(c) for multiple states under the good neighbor provision would constitute actions "promulgating [an] implementation plan under [CAA section 110]," judicial challenges to these actions have historically been heard in the D.C. Circuit Court of Appeals. Indeed, regional courts of appeals have transferred petitions for review of those FIPs or related actions on SIPs to the D.C. Circuit on at least two occasions over petitioners' opposition. *West Virginia Chamber of Commerce v. Browner*, 1998 WL 827315, at *6 (4th Cir.

1998); *Cedar Falls Utilities v. U.S. EPA*, No. 16-4504 (8th Cir. filed Feb. 22, 2017).

The EPA also disagrees with commenters' claim that the geographic applicability of the EPA's proposed rules dictates venue, as only final actions are subject to judicial review under CAA section 307(b)(1). We note, however, that the EPA signaled its intent in each of the proposed rules to take a single, nationally applicable final action. *See*, *e.g.*, 87 FR 9498, 9516 n.73 (February 22, 2022). Additionally, all of the proposed rules leading to this final action were supported by a national docket maintained by the EPA Headquarters and containing the key modeling files, data, and support documents that were used in the EPA's nationwide photochemical grid modeling analysis. *See*, *e.g.*, 87 FR 9484, 9485 (February 22, 2022).

One commenter cited to a December 2021 EPA action approving good neighbor SIPs for Florida, Georgia, North Carolina, and South Carolina in which the EPA stated that "[u]nder section 307(b)(1) of the CAA, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by" a specified date (*see* 86 FR 68413, 68420 (Dec. 2, 2021)), claiming that the EPA treated this prior multi-state SIP approval action as locally or regionally applicable and that it is therefore arbitrary and capricious to treat the final

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[89] 47 F.4th at 745 (D.C. Cir. 2022); *see also Texas v. EPA*, 983 F.3d 826, 835 (5th Cir. 2020) ("when a locally applicable action is based on a determination of nationwide scope or effect, the EPA has discretion to select the venue for judicial review").

rule promulgated today as nationally applicable. We note that, in the December 2021 rulemaking, the EPA stated only that venue would lie in the "appropriate circuit" and did not indicate whether the D.C. Circuit or a regional circuit court would be the appropriate circuit. In any case, commenters fail to identify anything in the December 2021 rulemaking that undermines the EPA's conclusion that the final action here is nationally applicable.

Nationwide Scope or Effect

Under CAA section 307(b)(1), an EPA action which is locally or regionally applicable may be filed only in the United States Court of Appeals "for the appropriate circuit" with one exception: if the locally or regionally applicable action (i) "is based on a determination of nationwide scope or effect," and (ii) the Administrator "finds and publishes that such action is based on such a determination," venue lies exclusively in the D.C. Circuit. The venue provision of the Act thus expressly grants the EPA complete discretion to determine whether to invoke an exception to the general rule that challenges to locally or regionally applicable actions be heard in the appropriate regional circuits. As the D.C. Circuit recently held in *Sierra Club v. EPA*, 47 F.4th 738 (D.C. Cir. 2022), the "EPA's decision whether to make and publish a finding of nationwide scope or effect is committed to the agency's discretion and thus is unreviewable."[89] Although "[a] court may review whether

[90] 47 F.4th at 746 ("The Act offers 'no basis on which a reviewing court could properly assess' the agency's discretionary decision" to make a nationwide scope or effect finding) (emphases added).

an action by EPA is nationally applicable, as well as whether locally or regionally applicable action is based on a determination of nationwide scope or effect *when EPA so finds and publishes*. . . . A court may not 'second-guess' the agency's discretionary decision to make and publish (or not) a finding of nationwide scope or effect."[90] For these reasons, the EPA disagrees with commenters' claim that the EPA lacks discretion to make and publish a finding that this action is based on a determination of nationwide scope or effect.

The Administrator is exercising the complete discretion afforded to him by the CAA to make and publish a finding that, if a court finds this action to be locally or regionally applicable, this action is based on a determination of "nationwide scope or effect" within the meaning of CAA section 307(b)(1). Thus, even if this action is locally or regionally applicable, challenges to it may only be brought in the D.C. Circuit. All of the factors discussed above that support the EPA's conclusion that this action is nationally applicable, as explained further here, also support the Administrator's finding that this action is based on a determination of nationwide scope or effect. In this final action, the EPA is interpreting and applying CAA section 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS

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[91] In the report on the 1977 Amendments that revised section 307(b)(1) of the CAA, Congress noted that the Administrator's determination that the "nationwide scope or effect" exception applies would be appropriate for any action that has a scope or effect beyond a single judicial circuit. *See* H.R. Rep. No. 95-294 at 323, 324, reprinted in 1977 U.S.C.C.A.N. 1402-03.

based on a common core of nationwide policy judgments and technical analysis concerning the interstate transport of pollutants throughout the continental U.S. In particular, the EPA is applying here the same, nationally consistent 4-step interstate transport framework for assessing good neighbor obligations for the 2015 ozone NAAQS that it has applied in other nationally applicable rulemakings, such as CSAPR, the CSAPR Update, and the Revised CSAPR Update. The EPA is relying on the results from nationwide photochemical grid modeling using a 2016 base year and 2023 projection year as the primary basis for its assessment of air quality conditions and pollution contribution levels at Step 1 and Step 2 of the EPA's 4-step interstate transport framework and applying a nationally uniform approach to the identification of nonattainment and maintenance receptors across the entire geographic area covered by this final action.[91] While the commenter is correct that the EPA has evaluated the particulars of each state's submission, our findings with respect to these submissions are nationally consistent and based on determinations of nationwide scope or effect. The EPA has evaluated each state's arguments for the use of alternative approaches or alternative sets of data with an eye to ensuring national consistency and avoiding inconsistent or inequitable results among upwind states (i.e., those states for which good neighbor obligations are being evaluated in this action) and between upwind and downwind states (i.e., those states that contain receptors signifying ozone nonattainment or maintenance problems).

Additionally, the EPA in this action has set forth its views on the importance of a nationally uniform approach to contribution-threshold analysis at Step 2 and has

evaluated states' arguments in support of a non-uniform approach. In this final action, we respond to these arguments in a nationally coordinated fashion, informed in part by the importance of ensuring consistency and fair and equitable treatment of both upwind contributing states and downwind states impacted by upwind pollution. Similarly, the EPA has also determined that other arguments from states regarding the other three steps of the 4-step interstate transport framework are insufficient to support approval of the SIP submissions. In many cases these arguments are highly similar to one another. The EPA's determinations with respect to these issues rest on the same or highly similar grounds, across all of the states covered by this action. Section V of the preamble presents consolidated responses to comments on these cross-cutting issues. All of these determinations have nationwide scope or effect.

The EPA therefore disagrees with commenters' claim that this action is "inherently state-specific" and dependent on the "facts and circumstances" of each particular SIP submission and the particularities of each state's air quality and emissions sources. In any case, even if this action is locally or regionally applicable, venue for any challenge to it is proper only in the D.C. Circuit because the action is based on one or more determinations of nationwide scope or effect and the Administrator is exercising his complete discretion to find and publish that it is based on such determinations.

Additionally, the Administrator finds that this is a matter on which national uniformity in judicial resolution of any

petitions for review is desirable, to take advantage of the D.C. Circuit's administrative law expertise, and to facilitate the orderly development of the basic law under the Act. The Administrator also finds that consolidated review of this action in the D.C. Circuit will avoid piecemeal litigation in the regional circuits, further judicial economy, and eliminate the risk of inconsistent results for different states, and that a nationally consistent approach to the CAA's mandate concerning interstate transport of ozone pollution constitutes the best use of Agency resources.

Commenters fail to support their argument that "courts do not defer to EPA's determination of venue," and it is not clear what the commenters mean in asserting that CAA section 307(b)(1) does not give the EPA "exclusive authority" to find that an action is based on a determination of nationwide scope or effect. As the *Sierra Club* court noted, courts may review whether a locally or regionally applicable action is based on a determination of nationwide scope or effect *when EPA so finds and publishes.* But the decision whether to make and publish a finding of nationwide scope or effect is committed to agency discretion by law.

Finally, the EPA disagrees with commenters' claim that the EPA's decision not to publish a "nationwide scope or

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[92] *See Texas v. EPA*, 983 F.3d at 834-35 (5th Cir. 2020); *see also Sierra Club v. EPA*, 47 F.4th 738, 746 (D.C. Cir. 2022) (noting that "[i]n deciding whether to make and publish a finding of nationwide scope or effect—and thus to direct review to [the D.C. Circuit], as opposed to a regional circuit—EPA may weigh any number of considerations").

effect" finding in its December 2021 action approving good neighbor SIPs for Florida, Georgia, North Carolina, and South Carolina (86 FR 68413 (Dec. 2, 2021)) prohibits the EPA from making a "nationwide scope or effect" finding in this action. Whether or not the EPA invoked the exception in CAA section 307(b)(1) for transferring venue to the D.C. Circuit in a prior action, that prior action has no bearing on the EPA's discretion to invoke the exception here. The CAA allows the EPA to direct locally or regionally applicable actions that are "based on a determination of nationwide scope or effect" to the D.C. Circuit, but it does not require the EPA to send such cases there, nor does it provide any criteria for the Agency's exercise of its discretion.[92]

The commenter correctly notes that the EPA has approved interstate transport SIPs for the 2015 ozone NAAQS for many states throughout the country that were found not to contribute above the one percent of NAAQS threshold at Step 2 and, in these actions, made no finding that the actions were based on determinations of nationwide scope or effect. However, the absence of such a finding in one action provides no basis for challenging the Agency's finding in another. Given the far greater degree of technical and policy judgment with respect to numerous national-scale issues that the EPA has exercised in this action as part of the EPA's review of these SIP submissions, it is reasonable for the EPA to seek national consistency in the judicial resolution of any petitions for review of this action.

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Appendix E

Commenter: Xcel Energy

Commenter ID: 52

Docket ID: EPA-R06-OAR-2021-0801

Comment:

Most importantly, the premature development of FIPs upsets the balance of state and federal authority under the CAA conflicting with the principals of cooperative federalism, as was intended under the Act. Congress delegated the authority to develop implementation plans to the states. EPA is only empowered to develop an implementation plan if a state fails to satisfactorily exercise this authority. EPA's disapproval of the Texas SIP is based on revised EPA modeling that TCEQ, in their comments, has identified as flawed. Xcel Energy encourages the EPA to allow the SIP process to work its way through the system as provided for under the regulations - allowing for comments on, or reformulation of, the SIP before EPA proposes or implements a FIP for the state of Texas. EPA's premature development of FIPs intrudes on authority that Congress specifically delegated to states.

This is particularly the case where, in the highly technical world of modeling, experts may disagree. In reviewing the competing technical evaluations, it is unclear whether EPA has the more correct view. At a minimum, we believe a more detailed technical discussion is warranted to first fully understand the differences, and second, reach some

technical consensus on the proper manner in which to evaluate impacts and determine whether the proposed SIP is truly not approvable

Response

The EPA responded generally to comments related to cooperative federalism in Section V.A.5 of the preamble. Here, the EPA responds in further detail to comments related to cooperative federalism and the EPA's authority.

The EPA does not agree that it has in any way overstepped its authority in disapproving the SIP submissions in this action. Commenters offer a cavalcade of arguments as to why the EPA cannot or should not be allowed to exercise its independent judgment in evaluating the arguments presented by the states and must approve each state's submission in deference to how states choose to interpret the CAA requirements they must meet. These arguments generally fail to acknowledge the past quarter-century of the EPA's efforts to implement the good neighbor provision through an efficient and equitable allocation of states' responsibility for interstate air pollution and the related case law generally upholding that interstate transport implementation framework. They also generally misstate the roles and responsibilities of the EPA and the states within the structure of the modern CAA as enacted by Congress in 1970 and reflected in fundamental CAA case law. Nonetheless, we will address these arguments in turn.[96]

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[96] Some topics raised by these comments are addressed in the preamble or in this RTC ("post hoc" justification, alleged changes

As an initial matter, the EPA agrees that the CAA establishes a framework for state-federal partnership to implement the NAAQS based on "cooperative federalism." Under the general model of cooperative federalism, the federal government establishes broad standards or goals, states are given the opportunity to determine how they wish to achieve those goals, and if states choose not to or fail to adequately implement programs to achieve those goals, a federal agency is empowered to directly regulate to achieve the necessary ends. Thus, the EPA also agrees that states have the obligation and opportunity in the first instance to develop an implementation plan to achieve the NAAQS under CAA section 110, that state air agencies are fully capable of developing SIP submissions that satisfy the requirements of the CAA, and that the EPA will approve SIP submissions under CAA section 110 that

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in EPA practice and policy, CAA section 126 petitions, requests for EPA to delay final action on SIP submission disapprovals and on proposing or finalizing FIPs, EPA's modeling, TCEQ's modeling, comments about EPA's application of the guidance memoranda, and SIP calls). EPA's response to comments about the withdrawal of Alabama's first good neighbor SIP submission for the 2015 ozone NAAQS is also addressed elsewhere in this document. Some commenters argued that EPA should judge a state's SIP submission based only on the information available at some past date; some commenters pointed to the time of the statutory deadline of the state submitting a SIP submission to EPA, while others pointed to the date a date submitted a SIP submission or EPA's statutory deadline to take action on a complete SIP submission. This topic is addressed elsewhere in the preamble and RTC. Other topics raised in these comments are beyond the scope of this rulemaking (i.e., substantive requirements of proposed FIP in separate rulemaking).

fully satisfy the requirements of the CAA. This sequence of steps is not in dispute.

The EPA does not, however, agree with the commenters' characterization of the EPA's role in the state-federal relationship as being "secondary" such that the EPA must defer to state choices heedless of the substantive objectives of the Act; such deference would be particularly inappropriate in the context of addressing interstate pollution. The EPA acknowledges that its role could be considered "secondary" in that it occurs "second" in time, after the states submit SIP submissions. The EPA believes that the commenters fundamentally misunderstand or inaccurately describe this action, as well as the "'division of responsibilities' between the states and the federal government" they identify in CAA section 110 citing the *Train-Virginia* line of cases[97] and other cases.[98] Those

[97] *See Virginia v. EPA*, 108 F.3d 1397, 1407 (D.C. Cir. 1997) (quoting *Train v. Natural Resources Defense Council, Inc.*, 421 U.S. at 79). The "Train-Virginia line of cases" are named for the U.S. Supreme Court case *Train v. Natural Resources Defense Council, Inc.*, 421 U.S. 60 (1975) (Train) and to the D.C. Circuit case *Virginia v. EPA*, 108 F.3d 1397 (D.C. Cir. 1997). The D.C. Circuit has described these cases as defining a "federalism bar" that constrains the EPA's authority with respect to evaluation of state SIP submissions under CAA section 110. *See*, *e.g.*, *Michigan v. EPA*, 213 F.3d 663, 687 (D.C. Cir. 2000).

[98] Commenters also cited the following to characterize the nature of the state-federal partnership in the CAA: *Union Elec. Co. v. EPA*, 427 U.S. 246 (1976), *Am. Elec. Power Co. v. Connecticut*, 565 U.S. 410 (2011), *Fla. Power & Light v. Costle*, 650 F.2d 579 (5th Cir. 1981), *North Carolina v. EPA*, 531 F.3d

cases, some of which pre-date the CAA amendments of 1990 resulting in the current good neighbor provision,[99] stand only for the proposition that EPA must approve state plans *if* they meet the applicable CAA requirements. But these cases say nothing about what those applicable requirements are. The EPA is charged under CAA section 110 with reviewing states' plans and approving or disapproving them. Thus, the EPA must ultimately determine whether state plans satisfy the requirements

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896 (D.C. Cir. 2008), *Luminant*, 675 F.3d 917 (5th. Cir. 2012), *Concerned Citizens of Bridesburg v. EPA*, 836 F.2d 777 (3d Cir. 1987), *Bethlehem Steel Corp. v. Gorsuch*, 742 F.2d 1028 (7th Cir. 1984), *Luminant Co. LLC v. EPA*, 714 F.3d 841 (5th. Cir. 2013), *North Dakota v. EPA*, 730 F.3d 750 (8th. Cir. 2013), and *Texas v. USEPA*, 829 F.3d 405 (5th. Cir. 2016).

[99] The 1970 version of the Act required SIPs to include "adequate provisions for intergovernmental cooperation" concerning interstate air pollution. CAA section 110(a)(2)(E), 84 Stat. 1681, 42 U.S.C. section 1857c–5(a)(2)(E). In 1977, Congress amended the Good Neighbor Provision to direct States to submit SIP submissions that included provisions "adequate" to "prohibi[t] any stationary source within the State from emitting any air pollutant in amounts which will . . . prevent attainment or maintenance [of air quality standards] by any other State." CAA section 108(a)(4), 91 Stat. 693, 42 U.S.C. § 7410(a)(2)(E) (1976 ed., Supp. II). Congress again amended the Good Neighbor Provision in 1990. The Act, in its current form, requires SIPs to "contain adequate provisions . . . prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will . . . contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any . . . [NAAQS]." CAA section 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i) (2006 ed.).

of the Act or not. Abundant case law, including these cases themselves, reflect an understanding that the EPA must evaluate SIP submissions under CAA section 110(k)(2) and (3).[100] If they are deficient, the EPA must so find, and directly implement the relevant requirements through a federal implementation plan under CAA section 110(c).[101]

In CAA section 110(a)(1), Congress imposed the duty upon all states to have a SIP that provides for "the implementation, maintenance, and enforcement" of the NAAQS. In section 110(a)(2), Congress clearly set forth the basic SIP requirements that "[e]ach such plan *shall*" satisfy.[102] By using the mandatory "shall" in section 110(a)(2), Congress established a framework of mandatory requirements *within which* states may exercise their

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[100] *See*, *e.g.*, *Virginia*, 108 F.3d at 1406. *See also*, *e.g.*, *Westar Energy v. EPA*, 608 Fed. App'x 1, 3 (D.C. Cir. 2015) ("EPA acted *well within the bounds* of its delegated authority when it disapproved of Kansas's proposed [good neighbor] SIP.") (emphasis added); *Oklahoma v. EPA*, 723 F.3d 1201, 1209 (10th Cir. 2013) (upholding EPA's disapproval of "best available retrofit technology" (BART) SIP, noting BART "does not differ from other parts of the CAA—states have the ability to create SIPs, but they are subject to EPA review").

[101] *EPA v. EME Homer City Generation, L.P.*, 572 U.S. 489, 495 (2014).

[102] CAA section 110(a)(2) (emphasis added); *see EPA v. EME Homer City Generation, L.P.*, 572 U.S. 489, 509 (2014) (holding that section 110(a)(2) "speaks without reservation" regarding what "components" a SIP "'shall' include"); H. Rept. 101–490, at 217 (calling the provisions of section 110(a)(2)(A) through (M) "the basic requirements of SIPs").

discretion to design SIPs to provide for attainment and maintenance of the NAAQS and to meet other CAA requirements, including the good neighbor provision. In other sections of the Act, Congress also imposed additional, more specific SIP requirements (e.g., the requirements in CAA section 182 associated with ozone nonattainment areas depending on their level of classification).

The U.S. Supreme Court's review of the original CSAPR rulemaking in *EME Homer City* directly affirms the critical role the EPA plays in interpreting and, if necessary, implementing the good neighbor provision and directly contradicts commenters' assertions that the EPA has only a limited role to play in reviewing states' approaches to addressing good neighbor requirements. In the original 2012 decision of the D.C. Circuit in *EME Homer City Generation, L.P. v. EPA* (*EME Homer City I*), the D.C. Circuit vacated the Cross-State Air Pollution Rule for two reasons, one being related to statutory interpretation of CAA section 110(a)(2)(D)(i), the other being "a second, entirely independent problem" based on EPA's purported overstep of the federalism bar identified in the *Train-Virginia* line of cases.[103] After recounting a list of decisions that recognize the cooperative federalism structure of the CAA, the D.C. Circuit concluded that even though states have the "primary responsibility" for implementing the NAAQS, in this case the states had no responsibility to address interstate transport until EPA

[103] *EME Homer City Generation, L.P. v. EPA*, 696 F.3d 7, 28 (D.C. Cir. 2012) (*EME Homer City I*), rev'd, 572 U.S. 489 (2014).

first quantified the obligations of the states.[104] The dissent, however, described the majority's application of the *Train-Virginia* cases as "a redesign of Congress's vision of cooperative federalism in implementing the CAA. . . ."[105] In reversing the *EME Homer City I* case in 2014, the U.S. Supreme Court held that the touchstone for identifying the division of responsibility between the EPA and the states is the text of CAA section 110(a)(2) itself.[106] The Court noted that pursuant to the CAA, after a NAAQS has been issued, a state must propose a SIP submission that meets the requirements of the CAA, including the good neighbor provision.[107] The Court went on to say that "nothing in the statute places EPA under an obligation to provide specific metrics to States before they undertake to fulfill their good neighbor obligations."[108] More relevant here, the Court upheld certain of EPA's interpretations of CAA section 110(a)(2)(D)(i)(I).[109]

After the U.S. Supreme Court's ruling in *EME Homer City*, the EPA's role under CAA section 110's cooperative federalism framework—as the agency charged with interpreting, applying, and, if necessary,

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[104] Id at

[105] *Id.* at 38 (Rogers, J., dissenting).

[106] *EPA v. EME Homer City Generation, L.P.*, 572 U.S. 489 (2014) at 507-510.

[107] *Id.* at 509 (citing, *inter alia*, CAA section 110(a)(2)).

[108] *Id.* at 509.

[109] *Id.* at 518-524.

ultimately achieving at the national level the fundamental requirements of CAA section 110(a)(2), and applying those reasonably interpreted requirements in evaluating state SIP submissions—cannot reasonably be in doubt.[110] Several commenters cite the dissent in *EME Homer City I* to argue that states are primarily responsible for quantifying and preventing their own significant contribution. EPA does not dispute that the CAA requires a state to prepare a SIP submission in the first instance before the EPA reviews it, but the EPA does dispute the implication that the EPA must defer in all instances to a state's interpretation of the requirements of the CAA, including a state's determination that its own sources of emissions and other emissions activities do not significantly contribute to nonattainment or interfere with maintenance in other states. The U.S. Supreme Court in *EME Homer City* reiterated that EPA's interpretation of ambiguous statutory language is afforded deference and determined that "[t]he Good Neighbor Provision delegates authority to EPA at least as certainly as the CAA provisions involved in *Chevron*[*, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984)]."[111] EPA is therefore granted deference in its interpretation of the requirements of CAA section 110(a)(2)(D)(i)(I) and is not required to accept at face value a state's interpretation in its own SIP submission that the state has fully satisfied the requirements of the CAA. The EPA notes also that courts have been deferential to the EPA's technical expertise in evaluating scientific data, which is particularly relevant

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[110] *See id.* at 495 (citing *Chevron*, 467 U.S. 837).

[111] *Id.* at 513.

in the context of the complex analyses undertaken to implement the good neighbor provision. *Wisconsin v. EPA*, 938 F.3d 303, 328 (D.C. Cir. 2019) (citing *North Carolina v. EPA*, 531 F.3d 896, 925 (D.C. Cir. 2008) (affording "substantial deference to EPA's technical expertise"); *Westar Energy, Inc. v. EPA*, 608 F. App'x 1 (D.C. Cir. 2015) (agency action "regarding technical matters within its area of expertise warrants particular deference") (citing *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 103 (1983); *W. Virginia v. EPA*, 361 F.3d 861, 867-68 (D.C. Cir. 2004)); *see also*, *e.g.*, *Catawba County v. EPA*, 571 F.3d 20, 41 (D.C. Cir. 2009) (we give an "extreme degree of deference to [EPA] when it is evaluating scientific data within its technical expertise") citing *City of Waukesha v. EPA*, 320 F.3d 228, 247 (D.C. Cir. 2003) (internal quotation marks omitted).

Notwithstanding the directly applicable holdings in *EME Homer City* concerning EPA's authority in implementing the good neighbor provision, commenters cite several other cases for arguments that EPA cannot substantively question the conclusions a state reaches about its own good neighbor obligations in a SIP submission: *Alaska Dep't of Env't Conservation v. EPA*, 540 U.S. 461 (2004), *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir.), *modified on reh'g in part*, 550 F.3d 1176 (D.C. Cir. 2008), *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000), *Virginia v. EPA*, 108 F.3d 1397 (D.C. Cir. 1997) *modified on reh'g*, 116 F.3d 499 (D.C. Cir. 1997), *Concerned Citizens of Bridesburg v. EPA*, 836 F.2d 777 (3d Cir. 1987), *Fla. Power & Light v. Costle*, 650 F.2d 579 (5th Cir. 1981), *Luminant Generation Company v. EPA*, 675 F.3d 917 (5th Cir. 2012), *Luminant*

Co. LLC v. EPA, 714 F.3d 841 (5th. Cir. 2013), *Texas v. EPA*, 829 F.3d 405 (5th. Cir. 2016), *Bethlehem Steel Corp. v. Gorsuch*, 742 F.2d 1028 (7th Cir. 1984), *Oklahoma v. EPA*, 723 F.3d 1201 (10th Cir. 2013), *North Dakota v. EPA*, 730 F.3d 750, 761 (8th Cir. 2013), and *Westar Energy, Inc. v. EPA*, 608 F. App'x 1 (D.C. Cir. 2015).

None of these cases actually support this proposition.

First, *Alaska Dep't of Envt'l Conservation* does not stand for the premise that the EPA's role in the state-federal partnership is limited to rote application of the exact language of the CAA. To the contrary, the Supreme Court in that case held that the EPA's "oversight role" in CAA sections 113(a)(5) and 167 included the authority to inquire whether a state's best available control technology (BACT) determination in a prevention of significant deterioration (PSD) permit is reasonable. Under those provisions, the Court held, "[O]nly when a state agency's BACT determination is 'not based on a reasoned analysis' may EPA step in to ensure that the statutory requirements are honored."[112] The Court went on to note, however, that the EPA's discretion in issuing a "stop order" under these provisions was more constrained than issuing initial approvals or disapprovals: "in contrast, a required approval may be withheld if EPA would come to a different determination on the merits."[113] The court further elaborated that "EPA's limited but vital role in enforcing BACT is consistent with a scheme that 'places

[112] *Alaska Dep't of Envt'l Conservation*, 540 U.S. 461, 490 (2004).

[113] *Id.* at 491.

primary responsibilities and authority with the States, backed by the Federal Government."[114] This case only underscores the role the EPA must play in assessing whether a SIP submission satisfies the requirements of the CAA. The Court noted, "We fail to see why Congress, having expressly endorsed an expansive surveillance role for the EPA in two independent CAA provisions, would then implicitly preclude the Agency from verifying substantive compliance with the BACT provisions and, instead, limit EPA's superintendence to the insubstantial question whether the state permitting authority had uttered the key words 'BACT.'"[115]

Commenters quote *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008) *modified on reh'g in part*, 550 F.3d. 1176 (DC Cir. 2008), the D.C. Circuit's review of the Clean Air Interstate Rule, for the sentence that a state is "the appropriate primary administrative unit to address interstate transport of emissions," but that quote was used in the context of the court determining that EPA may select an entire state, as opposed to part of a state, as the "unit of measurement" in either a SIP Call or a FIP rulemaking.[116] *North Carolina* cannot fairly be described as a case holding that EPA does not have authority to interpret the requirements of CAA section 110(a)(2)(D)(i)(I) when reviewing a good neighbor SIP submission.

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[114] *Id.* at 491 (citing S. Rep. No. 95-217, p. 29).

[115] *Id.* at 490.

[116] *North Carolina v. EPA*, 531 F.3d 896, 923 (D.C. Cir. 2008).

Appendix E

Commenters cite *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000) to argue that states get the first opportunity to identify which sources should be controlled and to what degree under the CAA. One commenter argues that the *Michigan* holding means that EPA can only identify the level of emissions reductions to be achieved by states under CAA section 110(a)(2)(D)(i)(I) and states themselves choose the controls. The *Michigan* court found that the NO_X budgets established in the NOX SIP call did not impermissibly trigger the 'federalism bar' outlined in the *Train-Virginia* line of cases in part because the action did not dictate which individual sources would be subject to controls.[117] In any event though, the action at issue in *Michigan* was a SIP call, not a SIP disapproval. In this SIP disapproval, EPA is not requiring any controls on any states. The *Michigan* case does not prohibit EPA from interpreting the requirements of CAA section 110(a)(2)(D)(i)(I) in reviewing a SIP submission. *Michigan* noted that under the state-federal partnership in the CAA, even though "states have considerable latitude in fashioning SIPs, the CAA 'nonetheless subject[s] the States to strict minimum compliance requirements' and gives EPA the authority to determine a state's compliance with the requirements."[118]

Commenters cite *Virginia v. EPA*, 108 F.3d 1397 (D.C. Cir. 1997), *modified on reh'g*, 116 F.3d 499 (D.C. Cir. 1997) for the arguments that states have a primary role and

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[117] *Michigan*, 213 F.3d 663, 687 (D.C. Cir. 2000).

[118] *Id.* (citing *Union Elec. Co. v. EPA*, 427 US 246, 256-257 (1976)).

responsibility in implementing NAAQS, the EPA cannot substitute states' judgement with its own, and the EPA cannot require specific controls in a SIP or condition approval of a SIP on specific controls. In *Virginia*, the Court remanded an EPA SIP call that sought to require states in the Northeast Ozone Transport Region to adopt restrictions on the sale of new cars to either match California's vehicle emission program or adopt a "Substitute Program" in their SIPs.[119] The *Virginia* court determined the Substitute Program was not a meaningful alternative and so EPA had impermissibly sought to specify particular controls in SIPs.[120] However, the D.C. Circuit clarified in *Appalachian Power Co. v. EPA*, 249 F.3d 1032 (D.C. Cir. 2001), "We did not suggest [in *Virginia*] that under § 110 states may develop their plans free of extrinsic legal constraints. Indeed, SIP development . . . commonly involves decision-making subject to various legal constraints."[121] Therefore, *Virginia* cannot be viewed as supporting an argument that EPA is not permitted to assess a state's judgements in a SIP submission for adherence with the requirements of CAA section 110(a)(2)(D)(i)(I). Furthermore, in these SIP disapprovals, EPA is not requiring any controls in any SIP.

One comment, citing *Virginia*, argued that the EPA cannot disapprove Maryland's choices of emissions limitations and

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[119] *Virginia v. EPA*, 108 F.3d 1397 (D.C. Cir. 1997).

[120] *Id at* 1415.

[121] *Appalachian Power Co. v. EPA*, 249 F.3d 1032, 1047 (D.C. Cir. 2001)

replace them with EPA's preferred emissions limitations in a FIP. However, Maryland concluded in its SIP submission that the state has no obligations to reduce any emissions beyond existing levels under the good neighbor provision for the 2015 ozone NAAQS and made no choice of any emissions limitations to include in its SIP. [87 FR 9463, 9469 (February 22, 2022); *see also* Maryland's October 16, 2019, SIP submittal included in docket ID No. EPA–R03–OAR–2021– 0872. (No other state included any enforceable emissions controls in their SIP submissions either.)

Commenters cite *Concerned Citizens of Bridesburg v. EPA*, 836 F.2d 777 (3d Cir. 1987) for the argument that the EPA is not allowed to make states adopt non-statutory, after the fact policy preferences through the SIP review process. In that case, the court reviewed EPA's action to rescind certain regulations addressing odor, for which there is no NAAQS, in Pennsylvania's SIP, approved by the EPA 13 years previously.[122] The court reached a decision on procedural challenges brought against EPA's action; the court determined that the EPA's action constituted a SIP revision, under an earlier version of the CAA, which was subject to certain procedural requirements, which the EPA failed to follow.[123] However, in this action the EPA is not modifying any prior approval of a SIP addressing CAA section 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS by EPA. Instead, the EPA is disapproving SIP submissions that fail to satisfy the requirements of CAA section

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[122] *Concerned Citizens of Bridesburg v. EPA*, 836 F.2d 777 (3d Cir. 1987).

[123] *Id.* at 784, 788.

110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS. Here, the EPA is not seeking to modify any previously approved SIP to account for updated understanding of the breadth of the EPA's legal authority.

Commenters cite *Fla. Power & Light v. Costle*, 650 F.2d 579 (5th Cir. 1981) to argue states have "extensive discretion" in the contents of their SIPs. In that case, under an earlier version of the CAA, Florida submitted a PSD SIP revision submission to accommodate Florida Power & Light's request for an exemption from the approved SIP related to sulfur dioxide emissions.[124] A subsequent "attachment" to the SIP revision submission to the EPA contained a 2-year limit on the exemption, which the EPA approved. Florida later requested to withdraw the 2-year limit, which EPA disapproved. Citing *Train*, the 5th Circuit rejected EPA's inclusion of the 2-year limit in the SIP revision approval on the basis that a 2-year limit was not a substantive requirement of the CAA, and the court rejected EPA's interpretation of Florida law that a 2-year limit would be necessary for the SIP revision to be enforceable under state law. The court's description of the EPA's role under the CAA in that the case did not stand for the premise that the EPA is not permitted to interpret the requirements of CAA; rather that the case concluded that EPA is confined to interpreting the requirements of the CAA. Here, the EPA is not approving, or disapproving, any aspect of a SIP revision that a state no longer wishes to be part of its SIP; the EPA is disapproving these SIP submissions for failing to demonstrate they satisfy the requirements of CAA section 110(a)(2)(D)(i)(I).

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[124] *See* 42 U.S.C. section 7410(a)(2) (Supp. 1979).

Appendix E

Commenters cite *Luminant Generation Company, L.L.C. et al. v. EPA*, 675 F.3d 917 (5th. Cir. 2012), for the premise that the EPA cannot disapprove SIP submissions on the basis of non-statutory policy preferences. Another version of this argument is that the EPA is not allowed to make states adopt non-statutory, after the fact policy preferences through the SIP review process. In *Luminant*, the 5th Circuit remanded the EPA's disapproval of a Texas SIP submission under CAA section 110(*l*) related to New Source Review (NSR) to consider whether the SIP submission comported with the requirements of CAA section 110(a)(2)(C) and 110(*l*); the court found it impermissible for EPA to inquire whether the SIP submission at issue comported with Texas law or satisfied "similar source" and "replicability" requirements, which the court found did not exist in the text of the CAA.

However, the EPA does not view the basis of the EPA's conclusions in the rule at issue in *Luminant* as analogous to this disapproval action. Alabama Power Company did not identify specifically what "non-statutory, policy preferences" they allege the EPA utilized in proposing to disapprove Alabama's earlier SIP submission. Association of Electric Companies of Texas, et. al. cite the EPA's methodology and quantification of Texas's "significant contribution" and "interference with maintenance" as well as EPA's rejection of Texas's analysis as non-statutory factors that cannot be used to assess Texas's SIP submission. A commenter also identifies the EPA modeling as a non-statutory requirement that cannot be used to disapprove Texas's SIP submission. They further argue that EPA has no authority to "second-guess"

TCEQ's modeling, particularly because the EPA has not promulgated regulations on modeling. Commenters further argue that the EPA is coercing the states to develop SIP submissions 'comparable' to the EPA's approach, which they say is not a statutory requirement.

The EPA is not disapproving any SIP submission because it did not use the EPA's modeling or methodology for assessing good neighbor obligations, nor is the EPA promulgating a SIP call seeking new SIP submissions. The EPA is disapproving the SIP submissions for failing to support a conclusion that the states have no good neighbor obligations under the 2015 ozone NAAQS. The EPA used its own modeling to inform its assessment of the SIP submissions with the requirements of CAA section 110(a)(2)(D)(i)(I).[125] Additionally, the EPA is authorized in its oversight role under the CAA to examine the analysis put forward by states, so the EPA is well within its authority to "second-guess" TCEQ's modeling.[126] The EPA is not required by the CAA to promulgate regulations governing the good neighbor analysis. Further, the EPA is not required to provide guidelines for CAA section 110(a)(2)(D)(i)(I).[127] However, each step in the EPA's analysis in this action is guided by the EPA's interpretation and application of each of the key terms of the CAA in this provision, reflecting over a quarter-century of administrative and judicial precedent. The good neighbor

[125] *See*, *e.g.*, 87 FR 9798, 9800-9801.

[126] For specific details on EPA's assessment of TCEQ modeling, please refer to the Evaluation of TCEQ Modeling TSD.

[127] *See EME Homer City* at 510.

provision remains unchanged from the statutory text the EPA first applied in the NOX SIP Call, and both the D.C. Circuit and the Supreme Court have had occasion to review the EPA's interpretation and application of those terms across several major rulemakings. In each of these rulemakings, the EPA has applied a consistent analytical approach to addressing the problem of interstate pollution, and that approach faithfully adheres to the terms of the statute as Congress enacted it. Each step of this process is tied to the statute: the identification of "nonattainment" and "maintenance" receptors (Step 1); the identification of "contribution" to those receptors by analyzing emissions from "any source or other type of emissions activity" within each state (Step 2); the analysis of what "amount" of that contribution is "significant" (or "interferes" with maintenance) (Step 3); and finally, the evaluation of whether the SIP "contains adequate provisions" "prohibiting" those emissions (Step 4).

Luminant Co. LLC v. EPA, 714 F.3d 841 (5th. Cir. 2013) is cited to support an argument that Congress tasked the EPA with setting NAAQS but gave states authority to implement it. Although the court in that case did say that "[T]he Act confines the EPA to the ministerial function of reviewing SIPs for consistency with the Act's requirements[,]" the court nevertheless upheld EPA's judgement of Texas's SIP submission that affirmative defenses for unplanned startup, shutdown, and maintenance/malfunction (SSM) activity conformed with the requirements of the CAA, and the EPA was afforded deference in concluding that affirmative defenses for planned SSM activity did not conform with

the requirements of the CAA.[128] That court, citing *Fla. Power & Light Co.* and *Bethlehem Steel*, found the EPA was not arbitrary and capricious in partially approving and partially disapproving Texas's iSIP submission.[129] The court also found that CAA section 110(*l*) did not require EPA, in disapproving a SIP submission, to prove a violation of the NAAQS would occur if the Agency approved part of an iSIP submission; rather, the EPA needs to provide "reasoning supporting its conclusion that the disapproved provision would interfere with an applicable requirements of the Act."[130] While the court used the term "ministerial" to describe EPA's role, this case actually reinforces that EPA's role includes interpreting the requirements of the CAA to determine whether a SIP submission comports with those requirements.

Commenters cite *Texas v. EPA*, 829 F.3d 405 (5th. Cir. 2016) to argue that the structure of the CAA itself indicates Congress wanted states to drive the regulatory process, not the EPA. In *Texas*, the 5th Circuit granted a preliminary stay of the EPA's disapproval of Oklahoma's and Texas' regional haze SIP submissions and promulgation of FIPs and did not reach the merits of either the EPA's assessment of the SIP submissions' compliance with the requirements of the CAA or the FIPs.[131] The decision cannot reasonably be interpreted to

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[128] *Luminant Co. LLC v. EPA*, 714 F.3d 841, 846 (5th. Cir. 2013)

[129] *Id.* at 858-859.

[130] *Id.* at 858.

[131] *Texas v. EPA*, 829 F.3d 405 (5th. Cir. 2016)

stand for the proposition that the EPA is not authorized to interpret the requirements of CAA section 110(a)(2)(D)(i)(I) in reviewing good neighbor SIP submissions.

Commenters cite *Bethlehem Steel Corp. v. Gorsuch*, 742 F.2d 1028 (7th Cir. 1984) for the argument that the EPA is not allowed to make states adopt non-statutory, after the fact policy preferences through the SIP review process. In that case, examining an earlier version of the CAA, the court found that EPA did not follow appropriate procedure in partially approving Indiana's SIP revision but disapproving an exemption provision, because the effect of doing that increased the stringency of the SIP for certain emissions above what Indiana had intended.[132] In the court's view, the EPA could have disapproved the SIP submission and followed the required procedure to promulgate a replacement plan.[133] The case did not conclude the EPA is barred from interpreting the requirements of the CAA in determining whether a SIP submission comports with the requirements of the CAA. Further, in this action the EPA's partial approval and partial disapproval of the SIP submissions from Minnesota and Wisconsin has no effect on the stringency of the states' SIPs, since neither SIP submission included any emissions controls to begin with.

Commenters cited *North Dakota v. EPA*, 730 F.3d 750 (8th. Cir. 2013) for the premise that states have primary

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[132] *Bethlehem Steel Corp. v. Gorsuch*, 742 F.2d 1028 (7th Cir. 1984).

[133] *Id*. at 1035.

responsibility to address interstate transport and the EPA is limited to only reviewing a SIP submission for compliance with the CAA. In *North Dakota*, the court dismissed all challenges but one to an action that simultaneously disapproved two SIP submissions and promulgated FIPs for North Dakota under CAA sections 110 and 169A (the court remanded EPA's best available retrofit technology (BART) determination in a FIP).[134] On one of the cited pages in *North Dakota*, 730 F.3d at 757, the court cited cases including *EME Homer City I*, a case later overturned by the Supreme Court, in its background section characterizing cooperative federalism. On the other page of *North Dakota* cited by commenters, *id.* at 761, the court, citing *Oklahoma v. EPA*, 723 F.3d 1201, 1213 n. 7 (10th. Cir. 2013), said, "Although the CAA grants states the primary role of determining the appropriate pollution controls within their borders, the EPA is left with more than the ministerial task of routinely approving SIP submissions."[135] The *North Dakota* court similarly cited the reasoning in *Alaska Department of Environmental Conservation v. EPA*, 540 U.S. 461 (2004) related to the EPA's authority under CAA section 167, finding it "persuasive" in the context of CAA section 169A.[136] This case does not support an argument that the EPA is not permitted to interpret the requirements of the CAA in reviewing a SIP submission for compliance with them. On the contrary, the case reinforces that EPA may (indeed, must) do so.

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[134] *North Dakota v. EPA*, 730 F.3d 750 (8th Cir. 2013).

[135] *Id.* at 760-761.

[136] *Id.* at 761.

Commenters cite *Oklahoma v. EPA*, 723 F.3d 1201 (10th. Cir. 2013) to argue that although SIPs are subject to federal oversight, the EPA's ability to reject a SIP submission is more limited compared to its authority to promulgate a FIP. The implication appears to be that the EPA somehow is so limited in its ability to review a SIP submission that the Agency cannot actually disapprove a SIP submission. But in that case, the court did not suggest that the EPA is barred from interpreting the requirements of the CAA in reviewing SIP submissions.[137] On the contrary, in *Oklahoma* the court found that EPA has the authority to interpret the requirements of the CAA and review SIP submissions accordingly. The court found that EPA lawfully disapproved Oklahoma's SIP submission related to best available retrofit technology (BART) at units at two generating stations for a sulfur dioxide NAAQS on the basis that EPA concluded Oklahoma's cost estimate methodology was flawed, and that the Agency was not arbitrary and capricious in simultaneously promulgating a FIP for Oklahoma in the same action as the SIP disapproval.[138] Although the commenters cite part of footnote 7 from that case: "EPA has less discretion when it takes actions to reject a SIP than it does when it promulgates a FIP" the full footnote went on to say "However, we believe that the EPA had reason to make the adjustments described in Section IV, Part B, even under the higher standard we would apply

[137] *Oklahoma v. EPA*, 723 F.3d 1201, 1209 (10th Cir. 2013) ("[S]tates have the ability to create SIPs, but they are subject to EPA review.").

[138] Id. at 1207, 1224,

when evaluating its actions in rejecting a SIP. OG & E has yet to provide any justification for providing estimates that departed from the [BART] guidelines."[139]

A few commenters, citing *Westar Energy, Inc. v. EPA*, 608 F. App'x 1 (D.C. Cir. 2015), argue that EPA is limited to identifying merely whether a SIP submission "explain[s] whether or not emissions from the state' significantly contribute to nonattainment in other states." That characterization of *Westar* is, however, a misleading representation. In that case, the D.C. Circuit upheld the EPA's disapproval of Kansas's good neighbor SIP submission for the 2006 24-hour PM2.5 NAAQS.[140] The court, noting that Agency action "regarding technical matters within its area of expertise warrants particular deference[,] *[s]ee Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 103 (1983); *W. Virginia v. EPA*, 361 F.3d 861, 867- 68 (D.C. Cir. 2004) [(citations cleaned up)]," held that EPA has authority to determine whether SIP submissions comply with the requirements of the CAA and acted within the bounds of its delegated authority when it disapproved Kansas's good neighbor SIP submission.[141] The court noted that a September 2009 guidance document indicated that states "'must explain whether or not emissions from the state' significantly contribute to nonattainment in other states and if so, 'address the impact'" and "that a state's conclusion 'must be supported by an adequate technical

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[139] *Id.* at 1213, n. 7.

[140] *Westar Energy, Inc. v. EPA*, 608 F. App'x 1 at *3.

[141] *Id.* at 3.

analysis.'"[142] The court also rejected arguments from petitioners that EPA was required to provide specific metrics to states before they undertook fulfilling their good neighbor obligations, citing the Supreme Court's decision in *EME Homer City.*[143] In its SIP submission, Kansas concluded it had no good neighbor obligations for the relevant NAAQS, but did not provide an analysis of the downwind impacts of its emissions. Kansas simply pointed out that four utility companies would reduce NOX and SOX emissions due to agreements in Kansas's Regional Haze SIP submission, but Kansas did not consider the downwind impacts of these or any other sources within the state. The EPA determined that Kansas's SIP submission lacked technical justification evaluating nonattainment and maintenance problems in downwind states.[144] In upholding the EPA, the court noted, "EPA acted *well within the bounds* of its delegated authority when it disapproved of Kansas's proposed [good neighbor] SIP." *Id.* at 3 (emphasis added).

Several commenters, pointing to the absence of CFR regulations for the good neighbor provisions for the 2015 ozone NAAQS, a guidance document from August 2006

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[142] *Id.*, citing William T. Hartnett, Director, Air Quality Policy Division, *Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24—hour Fine Particle (PM2.5) National Ambient Air Quality Standards (NAAQS)* at 3 (Sept. 25, 2009).

[143] *Id.* at 4 citing *EME Homer City* at 509-510.

[144] *Id.* at 3.

for the 1997 ozone NAAQS and the 1997 PM2.5 NAAQS,[145] the 2018 memoranda (discussed elsewhere in this action), and the text of the proposals themselves argue that the EPA has repeatedly recognized that CAA section 110(a)(2)(D)(i)(I) does not stipulate any one specific approach to addressing interstate transport but that EPA is now assessing SIP submissions against the Agency's policy preferences as opposed to the actual requirements of the CAA. One commenter argues that national consistency is not required by the CAA and so the EPA cannot consider it (or the regional nature of the ozone problem) in reviewing SIP submissions for compliance with CAA section 110(a)(2)(D)(i)(I) (conversely, another commenter says that inconsistent treatment across states would be arbitrary).

The EPA disagrees that the Agency in this action is shifting its approach to assessing SIP submissions under the good neighbor provision. The EPA has consistently analyzed good neighbor SIP submissions for compliance with the statute. As reiterated multiple times, the EPA is not required by the CAA to promulgate either regulations or guidance for good neighbor obligations in CAA section 110(a)(2)(D)(i)(I).[146] Specific comments related to the 2018 memoranda are addressed elsewhere.

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[145] "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Section 110(a)(2)(D)(i) for the 8-Hour Ozone and PM2.5 National Ambient Air Quality Standards" *available at* https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/20060815_harnett_final_section_110(a)(2)(D)(i)_guidance.pdf.

[146] *See EME Homer City* at 510.

Appendix E

The comment letter from the Association of Electric Companies of Texas, et. al. argues that the EPA's August 2006 Guidance required a "comparable" Step 3 analysis to the EPA's, but that the text of the CAA does not require this. Luminant also cites the August 2006 Guidance to argue that EPA has been inconsistent in how it has approached the good neighbor provision, pointing out that the 2006 Guidance suggested states should use a "comparable" assessment for significant contribution as the EPA. The EPA first notes the August 2006 guidance was by its own terms for the 1997 8-hour ozone NAAQS and the 1997 PM2.5 NAAQS and in particular was written for states that were not subject to CAIR FIPs for either NAAQS. As such, the document is not applicable to the 2015 ozone NAAQS. It was also issued before the D.C. Circuit issued its opinion and remanded CAIR in *North Carolina v. EPA*, 531 F.3d 896 (DC Cir. 2008), *modified on reh'g*, 550 F.3d. 1176 (DC Cir. 2008), thus many suggestions in the guidance are likely now obsolete. To the extent commenters are suggesting the August 2006 guidance was unlawful, EPA notes that the text of the August 2006 guidance document itself said that "this document is merely guidance that States or EPA may elect to follow or deviate from . . . , as appropriate. The ultimate determination of whether a given SIP submission by a State meets the statutory requirements of section 110(a)(2)(D)(i)(I) will be accomplished through case-by-case notice and comment rulemaking in which the facts and circumstances of each State will be evaluated by

EPA."[147] The general propositions for which commenters cited this guidance, that the EPA respects that states may devise their own approvable approaches to addressing good neighbor obligations, is still valid. But for the reasons explained in detail elsewhere in this record, no state that the EPA is acting on in this submission did develop an approvable approach.

The EPA also disagrees with the contention that the EPA significantly changed perspective regarding the purpose of infrastructure SIP submissions beginning with the 2008 ozone NAAQS. The EPA has always expected the portion of iSIPs that address CAA section 110(a)(2)(D)(i)(I) to provide adequate justification to support the conclusions therein. The August 2006 guidance, for the 1997 ozone NAAQS and 1997 PM2.5 NAAQS, indicated that states should submit a "technical demonstration" to support a conclusion that the state does not significantly contribute to nonattainment or interfere with maintenance in other states.[148] The September 2009 guidance, for the 2006 24-hour PM NAAQS, indicated that a "state's conclusion must be supported by an adequate technical analysis."[149] The September 2013 infrastructure SIPs guidance for the 2008 ozone NAAQS, the 2010 nitrogen dioxide NAAQS, the

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[147] "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Section 110(a)(2)(D)(i) for the 8-Hour Ozone and PM2.5 National Ambient Air Quality Standards" at 2, *available at* https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/20060815_harnett_final_section_110(a)(2)(D)(i)_guidance.pdf.

[148] *Id.* at 5.

[149] September 2009 Guidance at 3.

2010 sulfur dioxide NAAQS, and the 2012 fine particulate matter NAAQS did not include guidance on the good neighbor provision.[150]

In evaluating the SIP submissions here, the EPA used its now well-established 4-step interstate transport framework as a guide, while recognizing that states are not necessarily bound to follow that exact framework. This is not merely the application of an arbitrary "policy preference" but the application of a judicially-tested and upheld framework that provides continuity across multiple NAAQS and provides certainty and predictability with regard to how the EPA will evaluate SIP submissions. While not codified in the CFR, the EPA has a consistent policy and practice of applying this framework both in its evaluation of SIP submissions and in the promulgation of multiple rounds of FIPs to address prior ozone transport obligations. It is altogether reasonable for the Agency to continue to use that general framework as a guide to evaluate these SIP submissions to ensure consistency both across states and with prior good neighbor actions, while continuing to recognize states' discretion to offer alternative approaches that may be satisfactory toward achieving the Act's requirements.

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[150] "Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Section 110(a)(1) and 110(a)(2)" at 30, available at https://www3.epa.gov/airquality/urbanair/sipstatus/docs/Guidance_on_Infrastructure_SIP_Elements_Multipollutant_FINAL_Sept_2013.pdf. (EPA noted this guidance may be also informative for "infrastructure SIPs for new or reviewed NAAQS promulgated in the future.")

Thus, as explained in the proposals, in this action the EPA is not requiring states to adopt any particular emission limitation or to impose a specific control measure in a SIP submission. Rather, the EPA is determining that the SIP submissions that are the subject of this action do not support a finding that the statutory requirements of CAA section 110(a)(2)(D)(i)(I) have been met. In so doing, the EPA is acting pursuant to its supervisory role under the CAA's cooperative federalism framework, to ensure that SIPs satisfy those broad requirements that section 110(a)(2) mandates SIPs "shall" satisfy.

The EPA also disagrees with the argument that applying the consistent set of policy judgments made in this action across all states for purposes of evaluating interstate transport obligations goes against the framework of cooperative federalism or is otherwise not permitted by the CAA. These policy judgments in interpreting the CAA reflect consistency with relevant case law and past agency practice as reflected in the CSAPR and related rulemakings. Nationwide consistency in approach is particularly important in the context of interstate ozone transport, which is a regional-scale pollution problem involving many smaller contributors. Effective policy solutions to the problem of interstate ozone transport dating back to the NOX SIP Call (63 FR 57356 (October 27, 1998)) have necessitated the application of a uniform framework of policy judgments to ensure an "efficient and equitable" approach. *See EPA v. EME Homer City Generation, LP*, 572 U.S. 489, 519 (2014). One commenter argued that the regional nature of the problem of interstate transport does not confer greater authority

on the EPA to disapprove a SIP submission. However, in highlighting the regional nature of transport, the EPA is not claiming a qualitatively different authority to scrutinize SIP submissions under CAA section 110(a)(2)(D)(i)(I). The EPA's authority to assess a SIP submission for compliance with the CAA is the same for obligations associated with in-state pollution as is it for interstate pollution. But the regional, interstate nature of the ozone-transport issue simply underscores the value of the EPA's role as referee. In this regard, the EPA notes that at the time these disapprovals were proposed, not a single state out of the 49 states and Washington D.C. that had submitted a good neighbor SIP submission for the 2015 ozone NAAQS concluded that any emissions reductions beyond existing controls were necessary to satisfy CAA section 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS. This fact is entirely unsurprising, but also confirms the need for federal intervention through disapprovals at this stage of the process. As the D.C. Circuit observed with respect to regional haze, which, like ozone, is another interstate, collective-action problem posed by widespread pollution emitters:

> Regional haze is a problem in which the benefits of each state's emissions controls are largely felt in other states. Without federal intervention, then, a state calculating how hard it should press in limiting pollution has no incentive to consider resulting enhancements of other states' welfare. There is no reason to believe that New Mexico, for example, would without federal pressure tighten limits for in-state polluters an extra

> notch so that tourists could gaze at clear skies above the Grand Canyon. Even an anti-pollution commitment demonstrated by 'numerous stakeholder meetings and public workshops across the West' does not explain why one state would, absent federal pressure, martyr itself for another, or subject its electric power users (for example) to additional costs for the benefit of out-of-state interests. *Cf. Maryland People's Counsel v. FERC*, 245 U.S. App. D.C. 365, 761 F.2d 768, 778 (D.C. Cir. 1985) ('It is ridiculous to assume that' a company would 'engage in . . . self-sacrificing behavior' 'simply because there is nothing that stops it from doing so').

Center for Energy and Econ. Devel. v. EPA, 398 F.3d 653, 657-58 (D.C. Cir. 2005) (Williams, J.).

One commenter argued that the EPA's proposed FIPs supplant states' rights and authority. Another commenter argued that by having already proposed a FIP, the EPA is attempting to "coerce" local and state entities to conform with national policy. Another commenter argued EPA was "intentionally exploiting" the *EME Homer City* case to support costly federal policy. These comments are beyond the scope of this action. The proposed FIPs, which are not final at this time, are a separate rulemaking action. In any case, the existence of the proposed FIPs does not undermine the EPA's adherence to the procedural requirements of CAA section 110. Approval of these SIP submissions is not conditioned on any specific controls of any specific sources; rather, these SIP submissions are

being disapproved. If any state were to re-submit a good neighbor SIP submission, the EPA would review it against the requirements of CAA section 110(a)(2)(D)(i)(I) pursuant to CAA section 110(k)(3).

One commenter argued that the EPA cannot use the CAA to force particular control measures on states. EPA is not requiring any control measures in this action. Another commenter cites *Arkansas Elec. Co-op. Corp. v. Arkansas Pub. Serv. Comm'n*, 461 U.S. 375 (1983) for the premise that the regulation of utilities is associated with the police power of the states. EPA is not regulating any sources in this action.

One commenter said the EPA's approach to disapproving the SIPs essentially required states to conduct expensive photochemical grid modeling and amounted to an unfunded mandate. EPA disagrees that it is necessarily required for states to conduct photochemical grid modeling to develop approvable good neighbor SIP submissions. Still, the CAA empowers states in the first instance to implement the NAAQS, as many commenters have observed. "State air quality divisions are no strangers to complex air quality and meteorological modeling of interstate transport of emissions."151 Federal technical and financial support has always been available to states since the enactment of the modern CAA. Where states do not have or do not wish to dedicate the resources that may ultimately be required to develop an approvable SIP submission, the CAA is designed so that EPA will implement the requisite requirements through a FIP, without the state being obligated to expend its own resources. Thus, the EPA

disagrees that it has in any way created an unfunded mandate through this disapproval.

For this same reason, the EPA disagrees that this action violates or implicates anti-commandeering principles. One commenter cites *District of Columbia v. Train*, 521 F.2d 971 (D.C. Cir. 1975), *vacated sub nom. EPA v. Brown*, 431 U.S. 99 (1977), for the proposition that the EPA cannot commandeer states' resources or force them to implement federal policies or programs against their consent. No such commandeering of state regulatory authority or resources is occurring by virtue of this SIP disapproval action. The only consequence of this action is that the EPA has an obligation to promulgate a FIP addressing the relevant good neighbor obligations for the covered states within two years. *See* CAA section 110(c)(1). *Cf. D.C. v. Train*, 521 F.2d at 993 ("[W]here cooperation [from states] is not forthcoming, we believe that the recourse contemplated by the commerce clause is direct federal regulation of the offending activity. . . .").

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Appendix E

Commenter: Utah Petroleum Association and the Utah Mining Association

Commenter ID: 48

Docket ID: EPA-R08-OAR-2022-0315

Comment:

EPA must promulgate a Federal Implementation Plan ("FIP") within two years any time that EPA finds that the State failed to make the required SIP submission, finds that the SIP submission did not meet minimum criteria, or disapproves a SIP submitted by the State unless the State corrects the deficiency and EPA approves the plan prior to promulgating the FIP.

On April 6, 2022, EPA proposed its Good Neighbor Rule ("Proposed GNR") with a finding that emissions from 25 States including Utah contribute significantly to nonattainment of the 2015 ozone NAAQS for States downwind. EPA's Proposed GNR includes a FIP to address these emissions.

EPA jumped the gun. The timing of this Proposed Disapproval, six weeks after proposing a FIP as part of the GNR, is out of order and contrary to the requirements of the CAA, which requires that a Disapproval ***be finalized*** before EPA promulgates a FIP such as the GNR.

The timeline suggests that EPA has no intention of paying heed to the comments on the Proposed Disapproval.

Such disregard for comments would be a violation of required administrative procedures. EPA must fairly and completely consider all comments submitted.

Response

The sequencing of our actions here with regard to California, Nevada, and Utah is consistent with the procedural requirements of the CAA and the APA and with the EPA's past practice in our efforts to timely address good neighbor obligations. Comments pertaining to Wyoming are beyond the scope of this action. We have generally responded to comments on the timing of our action in Section V.A.1. of the preamble (comments related to the relationship between timing of proposals to disapprove SIPs and promulgate FIPs), Section V.A.2. of the preamble (comments related to requests for more time to revise SIP submissions), and Section V.A.3. of the preamble for (alleged harms to states caused by time between SIP submission and the EPA's action).

Here, we further elaborate on those responses, specific to these comments about the timing of our western state disapproval proposals. First, neither the Act nor the APA impose any limitations on the timing for when the EPA can propose a SIP or FIP action under CAA section 110. Second, EPA's timing is motivated by the need to address good neighbor obligations as expeditiously as practicable and no later than the next attainment date. Third, allegations that the disapprovals were a foregone conclusion or otherwise prejudiced for any reason is demonstrably proven false by the fact that we are

deferring action on Wyoming at this time in light of the updated air quality information. Fourth, there is nothing unprecedented in the EPA proposing FIPs in conjunction with or even before its proposed action on SIP submissions. For example, at the time the EPA proposed the CSAPR Update FIPs for the 2008 ozone NAAQS in December of 2015, we had not yet proposed action on several states' SIP submissions, but proposed and finalized those SIP disapproval actions prior to finalization of the FIPs. The proposed CSAPR Update was published on December 3, 2015, and included proposed FIPs for Indiana, Louisiana, New York, Ohio, Texas, and Wisconsin. 80 FR 75705. At that time, the EPA had not yet proposed action on good neighbor SIP submissions for the 2008 ozone NAAQS from those states; however, the EPA subsequently proposed and finalized these disapprovals. *See* 81 FR 38957 (June 15, 2016) (Indiana); 81 FR 53308 (Aug. 12, 2016) (Louisiana); 81 FR 58849 (Aug. 26, 2016) (New York); 81 FR 38957 (June 15, 2016) (Ohio); 81 FR 53284 (Aug. 12, 2016) (Texas); 81 FR 53309 (Aug. 12, 2016) (Wisconsin) before finalizing the CSAPR Update FIPs, published on October 26, 2016 (81 FR 74504).

As for Utah, the EPA has had the authority to promulgate a FIP for the state since January 6, 2020, which is the effective date of the EPA's finding of failure to submit for the state. 84 FR 66612 (December 5, 2019).

The public has been afforded an opportunity to comment on our proposed action on all three states' ozone transport SIP submissions, in addition to the opportunity to comment on the proposed FIP. The EPA has evaluated

and responded to these comments as relevant and within scope of this final action. Other issues raised by these comments are addressed in the following sections of this RTC document: 10.3 (Cooperative Federalism and the EPA's Authority), 10.5 (Comments Alleging "Pretext" or Intent to Require Generation Shifting), and 11.4 (Transport Policy - Western State Ozone Regulation).

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Appendix E

Commenter: Utah Division of Air Quality

Commenter ID: 47

Docket ID: EPA-R08-OAR-2022-0315

Comment:

[W]e note region-specific challenges in regulating ozone pollution, which underscore a need for stronger cooperation between Utah and EPA.

Regionally-Specific Ozone Challenges

The UDAQ would also like to note the exceptional challenges of reducing ozone in the Western United States. States in the West face significant and regionally-specific challenges in meeting ozone standards including elevated natural background ozone levels, increasing instances of wildfire, significant biogenic contributions, as well as the influence of internationally transported pollutants. Beyond these regionally-specific challenges, a significant portion of the emissions of Oxides of Nitrogen (NOX) in Utah comes from mobile sources, an area over which the State has limited regulatory authority. These combined regionally-specific challenges paired with the fact that a substantial portion of emissions is under federal jurisdiction make successful ozone reductions exceedingly challenging, furthering the need for strong cooperative federalism and active collaboration between our respective agencies. The actions proposed by the EPA to deny our SIP to fulfill a specific agenda undermine the trust

required for successful cooperative federalism, which only serves to further complicate the shared goals of reducing ozone concentrations and protecting public health.

Response

We respond to comments generally asserting the need for some different or alternative treatment of ozone transport in the western U.S. elsewhere in the record, including in Section V.C.3 of the preamble and in Section 4. We further respond to several specific comments here.

In response to commenters' assertion that emissions from the Uinta Basin are more impactful on downwind ozone concentrations in Colorado than emissions from EGUs in Utah, the EPA agrees with the commenter that the Uinta Basin ozone nonattainment area is geographically closer to the Colorado nonattainment receptors to which Utah is linked than the EGUs (such as Hunter and Huntington). However, we disagree that not being the nearest source to a downwind receptor might justify the lack of evaluation of emissions sources with substantial and potentially cost-effective emissions reduction opportunities in a state found to contribute to downwind nonattainment or maintenance receptor(s). Additionally, the EPA disagrees that the Uinta Basin emissions reductions the Agency recently finalized are more likely to produce significant reductions at the Colorado receptors than would reductions from the Utah EGUs. 87 FR 75334 (December 8, 2022). As stated in the FIP for the Uintah and Ouray Indian Reservation, "the EPA has concluded that winter ozone levels in the Uinta Basin are most significantly influenced by VOC emissions."

87 FR 75345. The EPA has determined that the action "will result in large reductions of VOC emissions" and "may result in very small NOx emission increases." 87 FR 75344, n. 63. These VOC reductions from the oil and gas sector are aimed to address high ozone levels during the winter in the Uinta Basin area which are associated with stagnant meteorological conditions that result in the build-up of local ozone precursor emissions and snow cover which enhances the reflectivity of solar radiation which, in turn, accelerates photochemical reactions of the trapped precursors to form locally high ozone concentrations. While the reductions of VOC emissions in the Uinta Basin will serve to address local winter ozone episodes, ozone production in the Uinta Basin in summer is expected to be NOX limited, and VOC reductions are unlikely to have nearly as pronounced an impact on reducing summer ozone transport contributions at the Colorado receptors. As stated regarding past ozone interstate transport rulemakings, "EPA and others have long regarded NOX to be the more significant ozone precursor in the context of interstate ozone transport," and "EPA's review of the data leads to the finding that, as proposed, a focus on NOX emission reductions is appropriate for the purpose of addressing interstate ozone transport." *See* 86 FR at 23087.

Nevada DEP (NDEP) argues that a 1 percent threshold is not an appropriate screening threshold for western states but that it did not include in its infrastructure SIP submission support for a 1 ppb screening threshold because its modeled contribution to downwind nonattainment or maintenance receptors was below 1 percent of the

NAAQS. We acknowledge that NDEP could not have foreseen a need to include a demonstration supporting a 1 ppb screening threshold based on the modeling results available at the time of its SIP submission. Nonetheless, as we stated in the proposed action to disapprove the Nevada infrastructure SIP, "following receipt and review of 49 good neighbor SIP submittals for the 2015 8-hour ozone NAAQS, EPA's experience has been that nearly every state that attempted to rely on a 1 ppb threshold did not provide sufficient information and analysis to support a determination that an alternative threshold was reasonable or appropriate for that state." 87 FR 31490. Further, based on the 2016v3 modeling for 2023, Nevada's contribution exceeds 1 ppb to nonattainment receptors in Davis and Salt Lake Counties in Utah.

In response to comments on the impact of wildfires, the EPA agrees that there are more and larger wildfires and, therefore potentially greater impacts of wildfire emissions on ozone in the West compared to the East. Where states have provided some information in their SIP submissions to suggest that atypical events related to wildfire incidents may have impacted the EPA modeling results, the EPA engaged with these arguments. For example, in the EPA's evaluation of California's evaluation of atypical events, the Agency did not necessarily disagree on the state Agency's findings.[153] However, the EPA found that the removal of data associated with atypical events (e.g., wildfires), as identified by the state still resulted in projected violations at downwind receptors. In addition, the EPA removed all

153. 87 FR 31443 at 31454.

concurred exceptional events data from the base period design values when projecting these data to 2023. To the extent commenters suggest the EPA should or is even required to complete an analysis to identify the impact of atypical events associated with wildfires, consistent with the EPA's guidance on Exceptional Events, we note that the onus is not on the EPA to complete such an analysis. In fact, the guidance commenters suggest the EPA abide by indicates that any such analysis which identifies days impacted by an atypical event needs to be initiated and completed by the state, not the Agency.[154]

Regarding commenter's calls for a unique consideration when evaluating good neighbor obligations in the western U.S., the EPA notes that emissions from wildfires were included as part of the emissions inventories used in the air quality modeling. Moreover, in the source apportionment modeling quantified the impacts of fires (wild and prescribed) on ozone concentrations at individual monitoring sites nationwide. In a similar manner, the impacts from international anthropogenic emissions outside the EPA's 12 km modeling domain are transported into the U.S. as "boundary conditions" from global scale modeling, as described in the final rule Air Quality Modeling TSD.

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154. 81 FR 68216 (October 2016), Treatment of Data Influenced by Exceptional Events.

Appendix E

In response to comments, we analyzed the contributions from fires[155] and from non-US sources (i.e., anthropogenic emissions in Canada and Mexico as well as anthropogenic and natural sources outside the U.S.) to quantify and compare the contributions from these types of sources at receptors in the eastern versus western U.S. Table 11-1 below provides the contributions from fires and from non-U.S. sources on average for each receptor area.[156] In this table the receptor areas are listed based on the magnitude of the contribution from fires. Overall, the contribution from fires declines progressively from west to east. The data indicate that each receptor area appears to fall into one of three geographic bins, based on the magnitude of the contributions. In the farthest western areas (i.e., California Tribal Lands, Yuma, and Salt Lake City) fires contribute approximately 3 ppb. In the areas that include the receptors in Texas, Las Cruces/Carlsbad/Hobbs/El Paso, and Denver the contributions from fires are about 2 ppb lower than in the far western areas at approximately 1 ppb. At receptors in Chicago, Coastal Wisconsin, and Coastal Connecticut, the contributions from fires are an order of magnitude lower than the contributions from fires at the receptors in the far western areas.

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155. In the source apportionment modeling the fires source tag includes emissions from fires in the U.S. as well as fires from the portions of Canada and Mexico that are inside the EPA's 12 km modeling domain.

156. The data in this table are based on the top 10-day average contribution metric which is calculated using the same method the EPA uses to calculate this metric for upwind states.

Appendix E

Examining the contributions from non-U.S. sources indicates a clear distinction between the east and the west. For example, in western areas (i.e., California Tribal Lands, Denver, Las Cruces/Carlsbad/Hobbs/El Paso, Salt Lake City, and Yuma) the contribution from non-U.S. sources ranges from approximately 40 ppb to 55 ppb. In contrast, in receptor areas in the East (i.e., Dallas, Houston/Brazoria/Galveston, Chicago, Coastal Wisconsin, and Coastal Connecticut) the contribution from non-US sources ranges from approximately 16 ppb to 22 ppb.

This analysis demonstrates that the EPA's modeling already captures the geographical differences between the west and the east in terms of the contributions from fires and non-U.S. sources. However, those differences supply no inherent justification why the anthropogenic emissions of western states should be ignored or discounted in evaluating their obligations under the good neighbor provision. In view of these results, the EPA disagrees with the commenter's request that the EPA should treat western states differently than eastern states when evaluating ozone transport.

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Table 11-1

Receptor Area	Fires	Non-U.S. Sources
Yuma	3.1	54.0
Salt Lake City	2.9	52.4
California Tribal Lands	2.9	40.9
Denver	1.3	44.1
Las Cruces/Carlsbad/Hobbs/El Paso	1.0	52.7
Houston/Brazoria/Galveston	1.0	22.4
Dallas	0.9	20.7
Coastal Connecticut	0.3	21.6
Coastal Wisconsin	0.2	16.5
Chicago	0.2	19.6

The EPA has made a number of updates and improvements to the 2016v2 modeling in response to comments and we find, as discussed in Section 4.2 (Model Performance), that 2016v3 achieves better modeling performance and can be considered reliable to inform air quality and contribution analysis at Step 1 and Step 2, including in the western regions. See Section 4.2 (Model Performance) for further discussion.

Nevada's concern with the expansion of the CSAPR trading program for power plants is beyond the scope of this rulemaking, which is focused on the adequacy of state SIP submissions in addressing the good neighbor provisions for the 2015 ozone NAAQS. Other issues raised

by these comments are addressed in Section V.C.1. of the preamble (mobile sources), as well as Sections 10.6 (Comments Alleging "Pretext" or Intent to Require Generation Shifting), 10.6 (Allegations that Disapprovals of Western State SIP Submissions was Predetermined), and 11.8 (Mobile Source Emissions).

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11.15 Out of Scope - Comments on the Proposed FIP

The EPA notes initially that PacifiCorp attached two comments submitted by Berkshire Hathaway Energy Company (BHE) and Ramboll on the Proposed FIP to its own comment on this SIP action. To the extent the BHE and Ramboll attachments made comments relevant to *this* action, the EPA responded in the preamble or in this RTC document. The EPA considers the comments in the BHE and Ramboll attachments specific to the Proposed FIP to be out of the scope of this rulemaking and they will not be reproduced here, but they are available in full in the docket (and are included in the same document as PacifiCorp's comments). The EPA anticipates responding to comments on the Proposed FIP in any final rulemaking resulting from that proposal.

APPENDIX F — EXCERPTS FROM AIR QUALITY MODELING TECHNICAL SUPPORT DOCUMENT (EPA-HQ-OAR-2021-0663-0085)

2. Air Quality Modeling Platform

The EPA used version 3 of the 2016-based air quality modeling platform (i.e., 2016v3) to provide the foundational model-input data sets for 2016 and 2023. In addition to emissions data for 2016 and 2023, this platform includes meteorology, initial and boundary condition concentrations, and other inputs representative of the 2016 base year. In response to public comments on the 2016v2 base year and projected emissions inventories, the 2016v3 emissions platform includes numerous updates to both anthropogenic and biogenic emissions and the addition of NOx emissions from lightning strikes. These updates are described in the document *Preparation of Emissions Inventories for the 2016v3 North American Emissions Modeling Platform* available in the docket for this final action.

2.1 Air Quality Model Configuration and Model Simulations

The photochemical model simulations performed for this final action used the Comprehensive Air Quality Model with Extensions (CAMx version 7.10, Ramboll, 2021). CAMx is a three-dimensional grid-based Eulerian air quality model designed to simulate the formation and fate of oxidant precursors, primary and secondary particulate matter concentrations, and deposition over regional and urban spatial scales (e.g., the contiguous U.S.).

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Consideration of the different processes (e.g., transport and deposition) that affect primary (directly emitted) and secondary (formed by atmospheric processes) pollutants at the regional scale in different locations is fundamental to understanding and assessing the effects of emissions on air quality concentrations. For this final action, as in the CSAPR Update, Revised CSAPR Update, and the proposed disapprovals, the EPA used the CAMx Ozone Source Apportionment Technology/Anthropogenic Precursor Culpability Analysis (OSAT/APCA) technique[6] to model ozone contributions, as described below in section 4.

The geographic extent of the modeling domains that were used for air quality modeling in this analysis are shown in Figure 2-1. The large outer domain covers the 48 contiguous states along with most of Canada and all of Mexico with a horizontal resolution of 36 x 36 km (i.e., 36 km domain). The inner domain covers the 48 contiguous states along with adjacent portions of Canada and Mexico at 12 x 12 km resolution (i.e., 12 km domain).

6. As part of this technique, ozone formed from reactions between biogenic VOC and NO_x with anthropogenic NO_x and VOC are assigned to the source of anthropogenic emissions.

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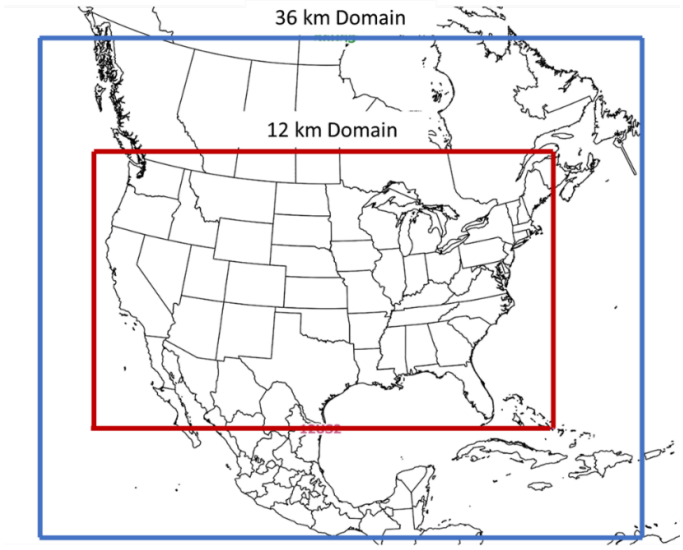

Figure 2-1. Air quality modeling domains.

CAMx requires a variety of input files that contain information pertaining to the modeling domain and simulation period. These include gridded, hourly emissions estimates and meteorological data, and initial and boundary concentrations. Separate emissions inventories were prepared for the 2016 base year and the 2023 projection. All other inputs (i.e., meteorological fields, initial concentrations, ozone column, photolysis rates, and boundary concentrations) were specified for the 2016 base year model application and remained unchanged for the projection-year model simulation.[7]

7. The EPA used the CAMx7.1chemparam.CB6r5_CF2E chemical parameter file for all the CAMx model runs described in this TSD.

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The 12 km CAMx model simulations performed for this final action are listed in Table 2-1. The simulation period for each run was preceded by a 15-day ramp-up period.

Table 2-1. Model run name, case name and simulation period for each model run.[8]

Analytic Year	***Model Run***	***Case Name***	***Simulation Period***
2016	2016 baseline	2016gf	Annual
2023	2023 baseline	2023gf	Annual
	2023 state total anthropogenic contributions	2023gf_ussa	May-September

* * *

8. Because the model simulations run in Greenwich Mean Time (GMT), the actual simulation period included October 1 in order to obtain MDA8 ozone concentrations based on local time for September 30.

Table 3-1. Average and maximum 2016-centered and 2023 base case 8-hour ozone design values and 2021 design values (ppb) at projected nonattainment receptors in 2023.

Monitor ID	State	County	2016 Centered Average	2016 Centered Maximum	2023 Average	2023 Maximum	2021
060650016	CA	Riverside	79.0	80.0	72.2	73.1	78
060651016	CA	Riverside	99.7	101.0	91.0	92.2	95
080350004	CO	Douglas	77.3	78	71.3	71.9	83
080590006	CO	Jefferson	77.3	78	72.8	73.5	81
080590011	CO	Jefferson	79.3	80	73.5	74.1	83
090010017	CT	Fairfield	79.3	80	71.6	72.2	79
090013007	CT	Fairfield	82.0	83	72.9	73.8	81
090019003	CT	Fairfield	82.7	83	73.3	73.6	80
481671034	TX	Galveston	75.7	77	71.5	72.8	72
482010024	TX	Harris	79.3	81	75.1	76.7	74
490110004	UT	Davis	75.7	78	72.0	74.2	78
490353006	UT	Salt Lake	76.3	78	72.6	74.2	76
490353013	UT	Salt Lake	76.5	77	73.3	73.8	76
551170006	WI	Sheboygan	80.0	81	72.7	73.6	72

Table 3-2. Average and maximum 2016-centered and 2023 base case 8-hour ozone design values and 2021 design values (ppb) at projected maintenance-only receptors.

Monitor ID	State	County	2016 Centered Average	2016 Centered Maximum	2023 Average	2023 Maximum	2021
40278011	AZ	Yuma	72.3	74	70.4	72.1	67
80690011	CO	Larimer	75.7	77	70.9	72.1	77
90099002	CT	New Haven	79.7	82	70.5	72.6	82
170310001	IL	Cook	73.0	77	68.2	71.9	71
170314201	IL	Cook	73.3	77	68.0	71.5	74
170317002	IL	Cook	74.0	77	68.5	71.3	73
350130021	NM	Dona Ana	72.7	74	70.8	72.1	80
350130022	NM	Dona Ana	71.3	74	69.7	72.4	75
350151005	NM	Eddy	69.7	74	69.7	74.1	77
350250008	NM	Lea	67.7	70	69.8	72.2	66
480391004	TX	Brazoria	74.7	77	70.4	72.5	75
481210034	TX	Denton	78.0	80	69.8	71.6	74

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Monitor ID	State	County	2016 Centered Average	2016 Centered Maximum	2023 Average	2023 Maximum	2021
481410037	TX	El Paso	71.3	73	69.8	71.4	75
482010055	TX	Harris	76.0	77	70.9	71.9	77
482011034	TX	Harris	73.7	75	70.1	71.3	71
482011035	TX	Harris	71.3	75	67.8	71.3	71
530330023	WA	King	73.3	77	67.6	71.0	64
550590019	WI	Kenosha	78.0	79	70.8	71.7	74
551010020	WI	Racine	76.0	78	69.7	71.5	73

Table 3-3. Average and maximum 2023 design values, and 2021 and preliminary 2022 design values and 4th high values at violating monitors (ppb).*

Monitor ID	State	County	2023 Average	2023 Maximum	2021	2022 P*	2021 4th High	2022 P 4th High
040070010	AZ	Gila	67.9	69.5	77	76	75	74
040130019	AZ	Maricopa	69.8	70.0	75	77	78	76
040131003	AZ	Maricopa	70.1	70.7	80	80	83	78
040131004	AZ	Maricopa	70.2	70.8	80	81	81	77
040131010	AZ	Maricopa	68.3	69.2	79	80	80	78
040132001	AZ	Maricopa	63.8	64.1	74	78	79	81
040132005	AZ	Maricopa	69.6	70.5	78	79	79	77
040133002	AZ	Maricopa	65.8	65.8	75	75	81	72
040134004	AZ	Maricopa	65.7	66.6	73	73	73	71
040134005	AZ	Maricopa	62.3	62.3	73	75	79	73
040134008	AZ	Maricopa	65.6	66.5	74	74	74	71
040134010	AZ	Maricopa	63.8	66.9	74	76	77	75
040137020	AZ	Maricopa	67.0	67.0	76	77	77	75

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Monitor ID	State	County	2023 Average	2023 Maximum	2021	2022 P*	2021 4th High	2022 P 4th High
040137021	AZ	Maricopa	69.8	70.1	77	77	78	75
040137022	AZ	Maricopa	68.2	69.1	76	78	76	79
040137024	AZ	Maricopa	67.0	67.9	74	76	74	77
040139702	AZ	Maricopa	66.9	68.1	75	77	72	77
040139704	AZ	Maricopa	65.3	66.2	74	77	76	76
040139997	AZ	Maricopa	70.5	70.5	76	79	82	76
040218001	AZ	Pinal	67.8	69.0	75	76	73	77
080013001	CO	Adams	63.0	63.0	72	77	79	75
080050002	CO	Arapahoe	68.0	68.0	80	80	84	73
080310002	CO	Denver	63.6	64.8	72	74	77	71
080310026	CO	Denver	64.5	64.8	75	77	83	72
090079007	CT	Middlesex	68.7	69.0	74	73	78	73
090110124	CT	New London	65.5	67.0	73	72	75	71
170310032	IL	Cook	67.3	69.8	75	75	77	72
170311601	IL	Cook	63.8	64.5	72	73	72	71

Monitor ID	State	County	2023 Average	2023 Maximum	2021	2022 P*	2021 4th High	2022 P 4th High
181270024	IN	Porter	63.4	64.6	72	73	72	73
260050003	MI	Allegan	66.2	67.4	75	75	78	73
261210039	MI	Muskegon	67.5	68.4	74	79	75	82
320030043	NV	Clark	68.4	69.4	73	75	74	74
350011012	NM	Bernalillo	63.8	66.0	72	73	76	74
350130008	NM	Dona Ana	65.6	66.3	72	76	79	78
361030002	NY	Suffolk	66.2	68.0	73	74	79	74
390850003	OH	Lake	64.3	64.6	72	74	72	76
480290052	TX	Bexar	67.1	67.8	73	74	78	72
480850005	TX	Collin	65.4	66.0	75	74	81	73
481130075	TX	Dallas	65.3	66.5	71	71	73	72
481211032	TX	Denton	65.9	67.7	76	77	85	77
482010051	TX	Harris	65.3	66.3	74	73	83	72
482010416	TX	Harris	68.8	70.4	73	73	78	71
484390075	TX	Tarrant	63.8	64.7	75	76	76	77

Monitor ID	State	County	2023 Average	2023 Maximum	2021	2022 P*	2021 4th High	2022 P 4th High
484391002	TX	Tarrant	64.1	65.7	72	77	76	80
484392003	TX	Tarrant	65.2	65.9	72	72	74	72
484393009	TX	Tarrant	67.5	68.1	74	75	75	75
490571003	UT	Weber	69.3	70.3	71	74	77	71
550590025	WI	Kenosha	67.6	70.7	72	73	72	71
550890008	WI	Ozaukee	65.2	65.8	71	72	72	72

* 2022 preliminary design values are based on 2022 measured MDA8 concentrations provided by state air agencies to the EPA's Air Quality System (AQS), as of January 3, 2023.

* * *

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4.3 Results of State-by-State All Anthropogenic Modeling

The largest contribution from each state to monitoring plus modeled downwind receptors in 2023 is provided in Table 4-1.[29] The largest contribution from each state to "violating monitor" receptors in 2023 is provided in Table 4-2.

The contribution metric values from each state and the other source tags at individual nonattainment and maintenance-only sites in the 2023 state-by-state all anthropogenic model runs are provided in Appendix C. A table with the total upwind state collective contribution expressed as the percent of the 2023 ozone design value is provided in Appendix D. The upwind states linked to each downwind receptor are identified in Appendix E.

Table 4-1. Largest contribution from each state to downwind nonattainment and maintenance-only receptors in 2023 (ppb).

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29 For California the largest contribution to a downwind receptor in 2023 is the contribution to monitoring site 060651016, which is a nonattainment receptor located on the Morongo Band of Mission Indians reservation in Riverside County, California. See preamble for information on how the EPA considers transport to receptors on tribal lands in this final action.

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Upwind State	Largest Contribution to Downwind Nonattainment Receptors	Largest Contribution to Downwind Maintenance-Only Receptors
Alabama	0.75	0.65
Arizona	0.54	1.69
Arkansas	0.94	1.21
California	35.27	6.31
Colorado	0.14	0.18
Connecticut	0.01	0.01
Delaware	0.44	0.56
District of Columbia	0.03	0.04
Florida	0.50	0.54
Georgia	0.18	0.17
Idaho	0.42	0.41
Illinois	13.89	19.09
Indiana	8.90	10.03
Iowa	0.67	0.90
Kansas	0.46	0.52
Kentucky	0.84	0.79
Louisiana	9.51	5.62
Maine	0.02	0.01
Maryland	1.13	1.28
Massachusetts	0.33	0.15
Michigan	1.59	1.56
Minnesota	0.36	0.85
Mississippi	1.32	0.91
Missouri	1.87	1.39

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Montana	0.08	0.10
Nebraska	0.20	0.36
Nevada	1.11	1.13
New Hampshire	0.10	0.02
New Jersey	8.38	5.79
New Mexico	0.36	1.59
New York	16.10	11.29
North Carolina	0.45	0.66
North Dakota	0.18	0.45
Ohio	2.05	1.98
Oklahoma	0.79	1.01
Oregon	0.46	0.31
Pennsylvania	6.00	4.36
Rhode Island	0.04	0.01
South Carolina	0.16	0.18
South Dakota	0.05	0.08
Tennessee	0.60	0.68
Texas	1.03	4.74
Utah	1.29	0.98
Vermont	0.02	0.01
Virginia	1.16	1.76
Washington	0.16	0.09
West Virginia	1.37	1.49
Wisconsin	0.21	2.86
Wyoming	0.68	0.67

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Table 4-2. Largest contribution to downwind 8-hour ozone "violating monitor" maintenance-only receptors (ppb).

Upwind State	Largest Contribution to Downwind Violating Monitor Maintenance-Only Receptors
Alabama	0.79
Arizona	1.62
Arkansas	1.16
California	6.97
Colorado	0.39
Connecticut	0.17
Delaware	0.42
District of Columbia	0.03
Florida	0.50
Georgia	0.31
Idaho	0.46
Illinois	16.53
Indiana	9.39
Iowa	1.13
Kansas	0.82
Kentucky	1.57
Louisiana	5.06
Maine	0.02
Maryland	1.14
Massachusetts	0.39
Michigan	3.47
Minnesota	0.64

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Mississippi	1.02
Missouri	2.95
Montana	0.12
Nebraska	0.43
Nevada	1.11
New Hampshire	0.10
New Jersey	8.00
New Mexico	0.34
New York	12.08
North Carolina	0.65
North Dakota	0.35
Ohio	2.25
Oklahoma	1.57
Oregon	0.36
Pennsylvania	5.20
Rhode Island	0.08
South Carolina	0.23
South Dakota	0.12
Tennessee	0.86
Texas	3.83
Utah	1.46
Vermont	0.03
Virginia	1.39
Washington	0.11
West Virginia	1.79
Wisconsin	5.10
Wyoming	0.42

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In CSAPR, the CSAPR Update, and the Revised CSAPR Update, and in the proposal for this final action the EPA used a contribution screening threshold of 1 percent of the NAAQS to identify upwind states that may significantly contribute to downwind nonattainment and/or maintenance problems and which warrant further analysis to determine if emissions reductions might be required from each state to address the downwind air quality problem. The EPA determined that 1 percent was an appropriate threshold to use in Step 2 because there were important, even if relatively small, contributions to identified nonattainment and maintenance receptors from multiple upwind states. The EPA has historically found that the 1 percent threshold is appropriate for identifying interstate transport linkages for states collectively contributing to downwind ozone nonattainment or maintenance problems because that threshold captures a high percentage of the total pollution transport affecting downwind receptors. The EPA received numerous comments on the use of the 1 percent screening threshold. Responses to these comments can be found in the preamble and Response to Comments (RTC) document for this final action.

* * *

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Appendix C

Ozone Contributions to Nonattainment & Maintenance-Only Receptors in 2023

The tables in this appendix provide projected design values and contribution metric data from each state and the other source tags to nonattainment and maintenance-only in 2023. Highlighted values denote contributions greater than or equal to the 1 percent of the NAAQS screening threshold. The contributions and design values are in units of ppb. Contributions to individual monitoring sites is provided in the file: "2016v3_DVs_state_contributions" which can be found in the docket for this final action.

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Design Values and Contributions for Monitoring plus Modeled Receptors in 2023 – Part 1					Contributions																											
Site ID	**ST**	**County**	**2023 Avg**	**2023 Max**	**AL**	**AZ**	**AR**	**CA**	**CO**	**CT**	**DE**	**DC**	**FL**	**GA**	**ID**	**IL**	**IN**	**IA**	**KS**	**KY**	**LA**	**ME**	**MD**	**MA**	**MI**	**MN**	**MS**	**MO**	**MT**	**NE**	**NV**	**NH**	**NJ**
40278011	AZ	Yuma	70.4	72.1	0.00	**2.97**	0.00	**6.31**	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
60650016	CA	Riverside	72.2	73.1	0.00	0.13	0.00	**27.46**	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
60651016	CA	Riverside	91.0	92.2	0.00	0.40	0.00	**35.27**	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
80350004	CO	Douglas	71.3	71.9	0.00	0.48	0.00	**1.60**	**15.68**	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.16	0.45	0.00	0.00
80590006	CO	Jefferson	72.8	73.5	0.00	0.54	0.00	**1.44**	**16.82**	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.45	0.00	0.00
80590011	CO	Jefferson	73.5	74.1	0.00	0.49	0.00	**1.31**	**17.54**	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.47	0.00	0.00
80690011	CO	Larimer	70.9	72.1	0.00	**0.86**	0.00	**0.90**	**13.99**	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.31	0.00	0.00
90010017	CT	Fairfield	71.6	72.2	0.02	0.01	0.10	0.02	0.04	**4.59**	0.35	0.01	0.01	0.03	0.02	0.51	**0.89**	0.13	0.06	0.60	0.12	0.00	**0.78**	0.06	**1.25**	0.15	0.05	0.23	0.05	0.06	0.01	0.01	**8.17**
90013007	CT	Fairfield	72.9	73.8	0.09	0.01	0.16	0.03	0.05	**3.94**	0.41	0.02	0.05	0.15	0.03	**0.72**	**1.18**	0.16	0.10	**0.80**	0.24	0.02	**0.96**	0.33	**1.38**	0.18	0.09	0.34	0.08	0.07	0.01	0.10	**7.22**
90019003	CT	Fairfield	73.3	73.6	0.09	0.01	0.15	0.03	0.05	**2.52**	0.44	0.03	0.05	0.15	0.02	0.67	**1.16**	0.15	0.10	**0.84**	0.24	0.00	**1.13**	0.06	**1.44**	0.17	0.09	0.32	0.07	0.07	0.01	0.01	**8.38**
90099002	CT	New Haven	70.5	72.6	0.09	0.01	0.14	0.02	0.04	**3.85**	0.56	0.04	0.05	0.17	0.03	**0.71**	**1.05**	0.21	0.09	**0.79**	0.17	0.01	**1.28**	0.15	**1.31**	0.23	0.08	0.32	0.08	0.09	0.01	0.02	**5.79**
170310001	IL	Cook	68.2	71.9	0.00	0.01	0.03	0.02	0.04	0.00	0.00	0.00	0.04	0.00	0.02	**18.80**	**7.11**	**0.90**	0.48	0.04	0.05	0.00	0.00	0.00	**1.16**	**0.85**	0.00	0.37	0.08	0.29	0.01	0.00	0.00
170314201	IL	Cook	68.0	71.5	0.00	0.01	0.06	0.05	0.05	0.00	0.00	0.00	0.01	0.00	0.03	**23.46**	**5.42**	0.42	0.18	0.06	0.02	0.00	0.00	0.00	**1.56**	0.50	0.00	0.54	0.07	0.10	0.01	0.00	0.00
170317002	IL	Cook	68.5	71.3	0.01	0.04	0.19	0.07	0.09	0.00	0.00	0.00	0.04	0.05	0.04	**20.58**	**6.55**	0.69	0.52	0.18	0.10	0.00	0.00	0.01	**1.00**	0.38	0.00	**1.39**	0.07	0.19	0.02	0.00	0.00
350130021	NM	Dona Ana	70.8	72.1	0.01	**1.04**	0.00	0.31	0.15	0.00	0.00	0.00	0.05	0.01	0.02	0.00	0.00	0.00	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.05	0.00	0.00
350130022	NM	Dona Ana	69.7	72.4	0.00	**1.06**	0.00	0.31	0.18	0.00	0.00	0.00	0.04	0.01	0.02	0.00	0.00	0.00	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.05	0.00	0.00

Appendix F

Design Values and Contributions for Monitoring plus Modeled Receptors in 2023 – Part 1					Contributions																											
Site ID	**ST**	**County**	**2023 Avg**	**2023 Max**	**AL**	**AZ**	**AR**	**CA**	**CO**	**CT**	**DE**	**DC**	**FL**	**GA**	**ID**	**IL**	**IN**	**IA**	**KS**	**KY**	**LA**	**ME**	**MD**	**MA**	**MI**	**MN**	**MS**	**MO**	**MT**	**NE**	**NV**	**NH**	**NJ**
350130021	NM	Dona Ana	70.8	72.1	0.01	**1.04**	0.00	0.31	0.15	0.00	0.00	0.00	0.05	0.01	0.02	0.00	0.00	0.00	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.05	0.00	0.00
350130022	NM	Dona Ana	69.7	72.4	0.00	**1.06**	0.00	0.31	0.18	0.00	0.00	0.00	0.04	0.01	0.02	0.00	0.00	0.00	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.05	0.00	0.00
350151005	NM	Eddy	69.7	74.1	0.00	**1.34**	0.02	0.63	0.18	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.10	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.08	0.08	0.00	0.00
350250008	NM	Lea	69.8	72.2	0.00	**1.66**	0.00	**0.71**	0.08	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.10	0.00	0.00
480391004	TX	Brazoria	70.4	72.5	0.27	0.01	**1.21**	0.01	0.05	0.00	0.00	0.00	0.10	0.10	0.01	0.07	0.07	0.25	0.37	0.09	**5.21**	0.00	0.00	0.00	0.00	0.14	0.53	0.64	0.05	0.21	0.00	0.00	0.00
481210034	TX	Denton	69.8	71.6	0.45	0.06	**0.92**	0.06	0.17	0.00	0.00	0.00	0.03	0.05	0.04	0.26	0.31	0.20	0.46	0.41	**2.87**	0.00	0.00	0.00	0.01	0.10	**0.91**	0.56	0.10	0.36	0.02	0.00	0.00
481410037	TX	El Paso	69.8	71.4	0.00	**1.69**	0.00	0.58	0.05	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
481671034	TX	Galveston	71.5	72.8	**0.75**	0.05	**0.94**	0.04	0.14	0.00	0.00	0.00	0.18	0.18	0.01	0.15	0.37	0.21	0.46	0.40	**9.51**	0.00	0.00	0.00	0.18	0.21	**1.32**	0.46	0.04	0.20	0.01	0.00	0.00
482010024	TX	Harris	75.1	76.7	0.23	0.00	0.57	0.00	0.01	0.00	0.00	0.00	0.50	0.05	0.00	0.01	0.01	0.16	0.16	0.01	**4.75**	0.00	0.00	0.00	0.00	0.10	0.35	0.25	0.01	0.10	0.00	0.00	0.00
482010055	TX	Harris	70.9	71.9	0.65	0.02	**0.73**	0.02	0.05	0.00	0.00	0.00	0.54	0.10	0.01	0.10	0.17	0.19	0.22	0.22	**5.49**	0.00	0.00	0.00	0.00	0.10	**0.91**	0.35	0.03	0.15	0.00	0.00	0.00
482011034	TX	Harris	70.1	71.3	0.33	0.01	**0.93**	0.01	0.02	0.00	0.00	0.00	0.18	0.10	0.00	0.05	0.06	0.23	0.22	0.05	**5.62**	0.00	0.00	0.00	0.00	0.11	0.47	0.45	0.03	0.15	0.00	0.00	0.00
482011035	TX	Harris	67.8	71.3	0.32	0.01	**0.90**	0.01	0.02	0.00	0.00	0.00	0.18	0.10	0.00	0.05	0.06	0.22	0.21	0.05	**5.44**	0.00	0.00	0.00	0.00	0.11	0.46	0.44	0.02	0.14	0.00	0.00	0.00
490110004	UT	Davis	72.0	74.2	0.00	0.28	0.00	**2.46**	0.03	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.00**	0.00	0.00
490353006	UT	Salt Lake	72.6	74.2	0.00	0.26	0.00	**2.75**	0.03	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**1.11**	0.00	0.00
490353013	UT	Salt Lake	73.3	73.8	0.00	0.28	0.00	**2.18**	0.04	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	**0.77**	0.00	0.00
550590019	WI	Kenosha	70.8	71.7	0.00	0.02	0.18	0.05	0.05	0.01	0.00	0.00	0.03	0.00	0.03	**19.09**	**8.06**	**0.70**	0.40	0.25	0.11	0.00	0.05	0.01	**1.02**	0.40	0.01	**1.01**	0.05	0.14	0.01	0.00	0.03
551010020	WI	Racine	69.7	71.5	0.03	0.02	0.34	0.05	0.04	0.01	0.00	0.00	0.03	0.01	0.02	**14.15**	**10.03**	0.62	0.35	0.32	0.34	0.00	0.05	0.02	**0.95**	0.41	0.15	**1.19**	0.04	0.12	0.01	0.00	0.03
551170006	WI	Sheboygan	72.7	73.6	0.02	0.03	0.62	0.04	0.06	0.01	0.00	0.00	0.01	0.01	0.02	**13.89**	**8.90**	0.67	0.40	0.44	0.34	0.00	0.05	0.01	**1.59**	0.36	0.10	**1.87**	0.07	0.18	0.01	0.00	0.04

Appendix F

Design Values and Contributions for Monitoring plus Modeled Receptors in 2023—Part 2					Contributions																									
Site ID	ST	County	2023 Avg	2023 Max	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	WV	WI	WY	TRIBAL	Canada & Mexico	Off-shore	Fires	Initial & Boundary	Bio-genic	Light-ning NOx
40278011	AZ	Yuma	70.4	72.1	0.11	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.03	0.16	0.00	0.00	0.03	0.00	0.00	0.00	0.01	9.43	0.54	3.10	44.52	2.26	0.55
60650016	CA	Riverside	72.2	73.1	0.04	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.00	0.08	0.00	0.00	0.00	0.00	2.32	2.10	2.93	33.31	3.13	0.19
60651016	CA	Riverside	91.0	92.2	0.11	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.04	0.06	0.00	0.00	0.05	0.00	0.00	0.00	0.01	2.43	1.65	2.91	43.70	3.39	0.60
80350004	CO	Douglas	71.3	71.9	0.28	0.00	0.00	0.01	0.00	0.03	0.10	0.00	0.00	0.00	0.01	0.00	0.16	**1.29**	0.00	0.00	0.06	0.00	0.00	0.68	0.17	0.85	0.09	1.39	42.66	3.44	1.30
80590006	CO	Jefferson	72.8	73.5	0.36	0.00	0.00	0.00	0.00	0.03	0.10	0.00	0.00	0.00	0.00	0.00	0.21	**1.17**	0.00	0.00	0.04	0.00	0.00	0.46	0.13	0.61	0.06	1.25	44.08	3.38	1.33
80590011	CO	Jefferson	73.5	74.1	0.29	0.00	0.00	0.00	0.00	0.02	0.11	0.00	0.00	0.00	0.00	0.00	0.11	**1.27**	0.00	0.00	0.05	0.00	0.00	0.46	0.14	0.56	0.06	1.30	44.68	3.23	1.04
80690011	CO	Larimer	70.9	72.1	0.47	0.00	0.00	0.01	0.00	0.05	0.09	0.00	0.00	0.00	0.00	0.00	0.34	**0.98**	0.00	0.00	0.05	0.00	0.00	0.67	0.18	0.94	0.08	1.25	41.93	4.15	3.12
90010017	CT	Fairfield	71.6	72.2	0.02	**16.10**	0.18	0.08	**1.34**	0.09	0.02	**5.83**	0.00	0.04	0.03	0.17	0.33	0.02	0.01	0.59	0.03	**0.79**	0.16	0.06	0.00	2.86	0.50	0.32	18.24	4.66	0.52
90013007	CT	Fairfield	72.9	73.8	0.05	**12.70**	0.45	0.11	**2.04**	0.13	0.03	**5.43**	0.04	0.16	0.04	0.27	0.52	0.03	0.02	**1.15**	0.05	**1.35**	0.21	0.08	0.00	2.29	0.68	0.31	19.33	5.53	0.72
90019003	CT	Fairfield	73.3	73.6	0.04	**12.96**	0.44	0.09	**2.05**	0.14	0.02	**6.00**	0.00	0.15	0.04	0.28	0.52	0.03	0.01	**1.16**	0.04	**1.37**	0.20	0.07	0.00	2.27	0.64	0.34	19.42	5.54	0.73
90099002	CT	New Haven	70.5	72.6	0.03	**11.29**	0.66	0.14	**1.98**	0.10	0.02	**4.36**	0.01	0.18	0.05	0.26	0.36	0.02	0.01	**1.76**	0.05	**1.49**	0.21	0.07	0.00	2.58	1.22	0.30	19.39	5.74	0.54
170310001	IL	Cook	68.2	71.9	0.05	0.14	0.00	0.45	0.68	0.62	0.02	0.25	0.00	0.00	0.08	0.00	**1.09**	0.02	0.00	0.02	0.06	0.08	**2.34**	0.06	0.00	1.19	0.12	0.15	20.95	8.44	0.84
170314201	IL	Cook	68.0	71.5	0.06	0.28	0.00	0.22	**1.21**	0.32	0.04	0.25	0.00	0.00	0.04	0.00	**1.05**	0.02	0.01	0.00	0.06	0.07	**2.86**	0.08	0.00	1.42	0.04	0.17	18.18	7.87	0.94
170317002	IL	Cook	68.5	71.3	0.10	0.21	0.00	0.16	**1.04**	0.65	0.04	0.20	0.00	0.00	0.04	0.05	**1.95**	0.06	0.01	0.01	0.06	0.09	**2.24**	0.11	0.00	1.11	0.14	0.22	15.80	10.54	1.21

Appendix F

Design Values and Contributions for Monitoring plus Modeled Receptors in 2023—Part 2					Contributions																									
Site ID	ST	County	2023 Avg	2023 Max	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	WV	WI	WY	TRIBAL	Canada & Mexico	Off-shore	Fires	Initial & Boundary	Bio-genic	Light-ning NOx
350130021	NM	Dona Ana	70.8	72.1	**2.87**	0.00	0.00	0.00	0.00	0.16	0.02	0.00	0.00	0.00	0.00	0.00	**4.74**	0.16	0.00	0.00	0.01	0.00	0.00	0.06	0.04	13.31	0.12	0.90	39.47	2.59	4.49
350130022	NM	Dona Ana	69.7	72.4	**2.89**	0.00	0.00	0.00	0.00	0.14	0.01	0.00	0.00	0.00	0.00	0.00	**3.59**	0.15	0.00	0.00	0.01	0.00	0.00	0.05	0.05	12.87	0.12	0.84	40.19	2.63	4.24
350151005	NM	Eddy	69.7	74.1	**6.52**	0.00	0.00	0.01	0.00	0.25	0.06	0.00	0.00	0.00	0.02	0.00	**1.91**	0.06	0.00	0.00	0.05	0.00	0.00	0.15	0.03	3.43	0.17	1.06	50.12	2.29	0.84
350250008	NM	Lea	69.8	72.2	**10.23**	0.00	0.00	0.01	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	**2.17**	0.10	0.00	0.00	0.01	0.00	0.00	0.05	0.02	3.81	0.15	0.60	45.73	2.23	1.96
480391004	TX	Brazoria	70.4	72.5	0.03	0.00	0.02	0.11	0.02	0.62	0.00	0.00	0.00	0.01	0.05	0.20	**29.21**	0.01	0.00	0.01	0.02	0.01	0.01	0.05	0.00	0.33	1.40	0.65	21.70	5.73	0.54
481210034	TX	Denton	69.8	71.6	0.11	0.00	0.00	0.09	0.09	**1.01**	0.02	0.01	0.00	0.00	0.08	0.68	**28.72**	0.07	0.00	0.00	0.04	0.00	0.02	0.23	0.01	0.33	0.37	0.85	20.40	7.34	0.75
481410037	TX	El Paso	69.8	71.4	**1.59**	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	**3.17**	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.02	13.73	0.16	1.41	40.91	2.38	3.76
481671034	TX	Galveston	71.5	72.8	0.13	0.01	0.03	0.16	0.31	**0.79**	0.00	0.03	0.00	0.07	0.04	0.60	**19.31**	0.04	0.00	0.01	0.01	0.03	0.08	0.10	0.00	0.41	5.74	0.78	19.49	6.64	0.62
482010024	TX	Harris	75.1	76.7	0.03	0.00	0.01	0.03	0.00	0.20	0.00	0.00	0.00	0.00	0.02	0.05	**31.24**	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.14	2.94	0.91	27.10	3.96	0.96
482010055	TX	Harris	70.9	71.9	0.05	0.00	0.01	0.05	0.03	0.23	0.00	0.00	0.00	0.01	0.02	0.47	**28.74**	0.02	0.00	0.00	0.01	0.00	0.01	0.04	0.00	0.30	2.42	0.81	21.47	5.10	0.79
482011034	TX	Harris	70.1	71.3	0.02	0.00	0.02	0.08	0.01	0.28	0.00	0.00	0.00	0.01	0.04	0.17	**28.33**	0.01	0.00	0.01	0.01	0.00	0.01	0.02	0.00	0.16	2.97	1.31	22.05	4.69	0.64
482011035	TX	Harris	67.8	71.3	0.02	0.00	0.02	0.07	0.01	0.27	0.00	0.00	0.00	0.01	0.03	0.16	**27.40**	0.01	0.00	0.01	0.01	0.00	0.01	0.02	0.00	0.15	2.88	1.26	21.32	4.54	0.62
490110004	UT	Davis	72.0	74.2	0.07	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.04	**8.72**	0.00	0.00	0.16	0.00	0.00	0.08	0.01	0.63	0.11	2.91	50.76	3.37	0.36
490353006	UT	Salt Lake	72.6	74.2	0.09	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.07	**9.15**	0.00	0.00	0.16	0.00	0.00	0.06	0.01	0.46	0.11	3.36	49.89	3.56	0.59
490353013	UT	Salt Lake	73.3	73.8	0.07	0.00	0.00	0.02	0.00	0.01	0.29	0.00	0.00	0.00	0.00	0.00	0.05	**7.49**	0.00	0.00	0.11	0.00	0.00	0.27	0.01	0.67	0.11	2.53	54.71	2.85	0.33
550590019	WI	Kenosha	70.8	71.7	0.06	0.21	0.02	0.13	**1.61**	0.49	0.03	0.40	0.00	0.00	0.03	0.02	**1.54**	0.03	0.00	0.09	0.05	0.21	**5.51**	0.06	0.00	1.02	0.14	0.19	14.88	11.28	0.83
551010020	WI	Racine	69.7	71.5	0.06	0.21	0.02	0.13	**1.24**	0.44	0.03	0.33	0.00	0.00	0.03	0.09	**1.57**	0.03	0.00	0.09	0.04	0.16	**7.98**	0.06	0.00	0.99	0.18	0.24	14.02	11.36	0.80
551170006	WI	Sheboygan	72.7	73.6	0.05	0.27	0.02	0.18	**1.55**	0.63	0.01	0.46	0.00	0.00	0.05	0.15	**1.03**	0.03	0.00	0.08	0.04	0.16	**7.22**	0.08	0.00	1.35	0.09	0.27	17.35	10.79	0.83

Appendix F

Design Values and Contributions for Violating Monitor Receptors in 2023—Part 1					Contributions																										
Site ID	ST	County	2023 Avg	2023 Max	AL	AZ	AR	CA	CO	CT	DE	DC	FL	GA	ID	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO	MT	NE	NV	NH	NJ
40070010	AZ	Gila	67.9	69.5	0.00	**7.65**	0.00	**1.55**	0.08	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.47	0.00	0.00
40130019	AZ	Maricopa	69.8	70.0	0.00	**15.32**	0.00	**1.68**	0.08	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.30	0.00	0.00
40131003	AZ	Maricopa	70.1	70.7	0.00	**13.83**	0.00	**2.69**	0.06	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.46	0.00	0.00
40131004	AZ	Maricopa	70.2	70.8	0.00	**14.56**	0.00	**1.54**	0.07	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.32	0.00	0.00
40131010	AZ	Maricopa	68.3	69.2	0.00	**13.90**	0.00	**2.65**	0.07	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.49	0.00	0.00
40132001	AZ	Maricopa	63.8	64.1	0.00	**12.84**	0.00	**1.44**	0.07	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.27	0.00	0.00
40132005	AZ	Maricopa	69.6	70.5	0.00	**13.81**	0.00	**1.56**	0.08	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.38	0.00	0.00
40133002	AZ	Maricopa	65.8	65.8	0.00	**13.59**	0.00	**1.52**	0.07	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.29	0.00	0.00
40134004	AZ	Maricopa	65.7	66.6	0.00	**11.01**	0.00	**2.72**	0.07	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.48	0.00	0.00
40134005	AZ	Maricopa	62.3	62.3	0.00	**12.29**	0.00	**2.39**	0.05	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.41	0.00	0.00
40134008	AZ	Maricopa	65.6	66.5	0.00	**13.06**	0.00	**1.44**	0.06	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.34	0.00	0.00
40134010	AZ	Maricopa	63.8	66.9	0.00	**12.31**	0.00	**1.47**	0.07	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.30	0.00	0.00
40137020	AZ	Maricopa	67.0	67.0	0.00	**14.42**	0.00	**1.51**	0.07	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.29	0.00	0.00
40137021	AZ	Maricopa	69.8	70.1	0.00	**14.25**	0.00	**2.14**	0.06	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.41	0.00	0.00
40137022	AZ	Maricopa	68.2	69.1	0.00	**13.92**	0.00	**2.09**	0.06	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.40	0.00	0.00
40137024	AZ	Maricopa	67.0	67.9	0.00	**14.42**	0.00	**1.51**	0.07	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.29	0.00	0.00
40139702	AZ	Maricopa	66.9	68.1	0.00	**12.53**	0.00	**2.20**	0.07	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.34	0.00	0.00
40139704	AZ	Maricopa	65.3	66.2	0.00	**12.20**	0.00	**1.83**	0.06	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.40	0.00	0.00
40139997	AZ	Maricopa	70.5	70.5	0.00	**14.56**	0.00	**1.63**	0.07	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.31	0.00	0.00
40218001	AZ	Pinal	67.8	69.0	0.00	**9.81**	0.00	**2.05**	0.08	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.36	0.00	0.00
80013001	CO	Adams	63.0	63.0	0.00	0.64	0.00	**1.05**	**13.94**	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.32	0.00	0.00
80050002	CO	Arapahoe	68.0	68.0	0.00	0.47	0.00	**1.81**	**14.72**	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.58	0.00	0.00
80310002	CO	Denver	63.6	64.8	0.00	0.65	0.00	**1.06**	**14.08**	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.32	0.00	0.00
80310026	CO	Denver	64.5	64.8	0.00	0.66	0.00	**1.07**	**14.27**	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.32	0.00	0.00
90079007	CT	Middlesex	68.7	69.0	0.10	0.01	0.17	0.03	0.04	**5.39**	0.36	0.03	0.09	0.31	0.03	0.55	**0.95**	0.13	0.09	**0.88**	0.26	0.02	**1.04**	0.39	**0.85**	0.13	0.10	0.33	0.07	0.06	0.01	0.10	**5.29**
90110124	CT	New London	65.5	67.0	0.16	0.01	0.20	0.02	0.02	**6.76**	0.29	0.03	0.07	0.19	0.01	0.55	**0.84**	0.15	0.10	0.53	0.21	0.00	**0.97**	0.15	**1.36**	0.15	0.12	0.38	0.03	0.05	0.00	0.00	**3.93**

Appendix F

Design Values and Contributions for Violating Monitor Receptors in 2023—Part 1					Contributions																											
Site ID	ST	County	2023 Avg	2023 Max	AL	AZ	AR	CA	CO	CT	DE	DC	FL	GA	ID	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO	MT	NE	NV	NH	NJ
170310032	IL	Cook	67.3	69.8	0.00	0.04	0.08	0.04	0.07	0.00	0.00	0.00	0.04	0.00	0.03	**17.27**	**8.22**	**0.79**	0.62	0.05	0.07	0.00	0.00	0.01	**1.15**	0.60	0.00	0.62	0.08	0.26	0.01	0.00	0.00
170311601	IL	Cook	63.8	64.5	0.00	0.00	0.04	0.02	0.04	0.00	0.00	0.00	0.02	0.00	0.03	**17.08**	**5.85**	0.61	0.27	0.06	0.02	0.00	0.00	0.01	**2.03**	0.59	0.00	0.44	0.08	0.16	0.01	0.00	0.01
181270024	IN	Porter	63.4	64.6	0.00	0.03	0.08	0.04	0.05	0.00	0.00	0.00	0.04	0.00	0.02	**9.11**	**15.38**	0.58	0.55	0.04	0.08	0.00	0.00	0.00	**1.21**	0.57	0.00	0.56	0.07	0.19	0.01	0.00	0.00
260050003	MI	Allegan	66.2	67.4	0.01	0.04	0.61	0.10	0.20	0.00	0.00	0.00	0.03	0.01	0.06	**10.66**	**6.47**	**1.13**	**0.82**	0.60	0.36	0.00	0.00	0.00	**2.02**	0.64	0.08	**2.17**	0.10	0.26	0.03	0.00	0.00
261210039	MI	Muskegon	67.5	68.4	0.04	0.04	**1.08**	0.06	0.17	0.00	0.00	0.00	0.03	0.09	0.04	**14.29**	**9.39**	0.37	0.58	**0.74**	0.57	0.00	0.00	0.00	**1.98**	0.22	0.14	**2.95**	0.08	0.19	0.02	0.00	0.00
320030043	NV	Clark	68.4	69.4	0.00	**0.77**	0.00	**6.97**	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**9.05**	0.00	0.00
350011012	NM	Bernalillo	63.8	66.0	0.00	**1.62**	0.00	0.60	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00
350130008	NM	Dona Ana	65.6	66.3	0.00	**1.13**	0.01	0.44	0.12	0.00	0.00	0.00	0.04	0.01	0.02	0.00	0.00	0.00	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.06	0.00	0.00
361030002	NY	Suffolk	66.2	68.0	0.05	0.01	0.16	0.03	0.05	0.17	0.42	0.03	0.02	0.09	0.02	0.50	**0.96**	0.19	0.13	**0.74**	0.15	0.00	**1.14**	0.02	**1.12**	0.14	0.06	0.35	0.06	0.07	0.01	0.00	**8.00**
390850003	OH	Lake	64.3	64.6	0.03	0.02	0.19	0.08	0.10	0.03	0.01	0.00	0.01	0.00	0.06	**1.33**	**1.81**	0.39	0.25	**1.57**	0.16	0.01	0.05	0.07	**3.47**	0.24	0.14	0.59	0.08	0.13	0.02	0.02	0.10
480290052	TX	Bexar	67.1	67.8	0.05	0.09	0.09	0.03	0.10	0.00	0.00	0.00	0.04	0.02	0.02	0.01	0.01	0.02	0.24	0.02	**1.02**	0.00	0.00	0.00	0.00	0.03	0.15	0.05	0.02	0.13	0.00	0.00	0.00
480850005	TX	Collin	65.4	66.0	0.51	0.11	0.64	0.08	0.13	0.00	0.00	0.00	0.08	0.13	0.03	0.29	0.31	0.21	0.24	0.43	**2.96**	0.00	0.00	0.00	0.01	0.08	**0.84**	0.53	0.08	0.18	0.02	0.00	0.00
481130075	TX	Dallas	65.3	66.5	0.47	0.05	**0.93**	0.05	0.14	0.00	0.00	0.00	0.03	0.07	0.04	0.35	0.39	0.32	0.61	0.51	**2.85**	0.00	0.00	0.00	0.00	0.19	**0.87**	0.66	0.10	0.43	0.01	0.00	0.00
481211032	TX	Denton	65.9	67.7	**0.79**	0.05	**0.95**	0.05	0.16	0.00	0.00	0.00	0.09	0.09	0.04	0.27	0.29	0.23	0.41	0.40	**3.54**	0.00	0.00	0.00	0.00	0.11	**1.02**	**0.70**	0.10	0.25	0.01	0.00	0.00
482010051	TX	Harris	65.3	66.3	0.59	0.02	0.68	0.02	0.05	0.00	0.00	0.00	0.50	0.09	0.01	0.09	0.16	0.18	0.20	0.20	**5.06**	0.00	0.00	0.00	0.00	0.10	**0.84**	0.32	0.02	0.14	0.00	0.00	0.00
482010416	TX	Harris	68.8	70.4	0.60	0.03	**0.93**	0.02	0.06	0.00	0.00	0.00	0.14	0.11	0.01	0.08	0.15	0.21	0.23	0.18	**4.87**	0.00	0.00	0.00	0.00	0.10	**0.77**	0.46	0.03	0.16	0.00	0.00	0.00
484390075	TX	Tarrant	63.8	64.7	0.41	0.05	**0.81**	0.05	0.14	0.00	0.00	0.00	0.02	0.04	0.04	0.31	0.41	0.17	0.39	0.46	**1.76**	0.00	0.00	0.00	0.01	0.09	**0.84**	0.42	0.09	0.31	0.01	0.00	0.00
484391002	TX	Tarrant	64.1	65.7	0.51	0.06	**1.16**	0.05	0.15	0.00	0.00	0.00	0.05	0.29	0.05	0.16	0.20	0.15	0.53	0.31	**1.83**	0.00	0.01	0.01	0.01	0.10	0.69	0.45	0.09	0.35	0.01	0.00	0.02
484392003	TX	Tarrant	65.2	65.9	0.44	0.05	**0.85**	0.04	0.15	0.00	0.00	0.00	0.02	0.04	0.05	0.30	0.41	0.21	0.53	0.47	**1.84**	0.00	0.00	0.00	0.00	0.10	**0.88**	0.51	0.12	0.37	0.01	0.00	0.00
484393009	TX	Tarrant	67.5	68.1	0.40	0.05	0.65	0.05	0.14	0.00	0.00	0.00	0.02	0.04	0.04	0.24	0.28	0.21	0.55	0.38	**2.10**	0.00	0.00	0.00	0.01	0.10	**0.75**	0.54	0.11	0.37	0.01	0.00	0.00
490571003	UT	Weber	69.3	70.3	0.00	0.36	0.00	**2.66**	0.04	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	**1.11**	0.00	0.00
550590025	WI	Kenosha	67.6	70.7	0.02	0.04	0.39	0.09	0.10	0.00	0.00	0.00	0.01	0.00	0.04	**16.53**	**5.51**	**0.71**	0.41	0.16	0.34	0.00	0.00	0.00	0.66	0.51	0.11	**1.53**	0.08	0.21	0.03	0.00	0.00
550890008	WI	Ozaukee	65.2	65.8	0.03	0.04	0.39	0.07	0.09	0.01	0.00	0.00	0.01	0.00	0.04	**11.46**	**5.75**	0.69	0.43	0.22	0.25	0.00	0.04	0.01	**0.92**	0.36	0.14	**1.64**	0.08	0.21	0.02	0.00	0.03

Appendix F

Design Values and Contributions for Violating Monitor Receptors in 2023—Part 2					Contributions																									
Site ID	ST	County	2023 Avg	2023 Max	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	WV	WI	WY	TRIBAL	Canada & Mexico	Off-shore	Fires	Initial & Boundary	Bio-genic	Light-ning NOx
40070010	AZ	Gila	67.9	69.5	0.16	0.00	0.00	0.01	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.09	0.46	0.00	0.00	0.04	0.00	0.00	0.06	0.04	1.83	0.22	1.97	50.21	2.25	0.50
40130019	AZ	Maricopa	69.8	70.0	0.33	0.00	0.00	0.01	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.33	0.27	0.00	0.00	0.04	0.00	0.01	0.04	0.07	2.83	0.21	2.18	41.74	2.66	1.32
40131003	AZ	Maricopa	70.1	70.7	0.17	0.00	0.00	0.01	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.09	0.37	0.00	0.00	0.04	0.00	0.00	0.03	0.06	3.17	0.27	1.42	42.78	2.69	1.68
40131004	AZ	Maricopa	70.2	70.8	0.19	0.00	0.00	0.01	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.12	0.30	0.00	0.00	0.03	0.00	0.00	0.04	0.06	2.91	0.22	1.85	43.33	2.49	1.92
40131010	AZ	Maricopa	68.3	69.2	0.15	0.00	0.00	0.01	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.09	0.40	0.00	0.00	0.04	0.00	0.00	0.05	0.06	2.83	0.28	1.40	41.87	2.61	1.07
40132001	AZ	Maricopa	63.8	64.1	0.25	0.00	0.00	0.01	0.00	0.03	0.07	0.00	0.00	0.00	0.00	0.00	0.28	0.25	0.00	0.00	0.04	0.00	0.01	0.04	0.05	2.45	0.19	2.13	39.89	2.23	1.02
40132005	AZ	Maricopa	69.6	70.5	0.18	0.00	0.00	0.01	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	0.11	0.36	0.00	0.00	0.03	0.00	0.00	0.05	0.07	2.38	0.23	1.62	44.56	2.49	1.37
40133002	AZ	Maricopa	65.8	65.8	0.17	0.00	0.00	0.01	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.11	0.26	0.00	0.00	0.02	0.00	0.00	0.03	0.06	2.85	0.21	1.66	40.56	2.33	1.84
40134004	AZ	Maricopa	65.7	66.6	0.15	0.00	0.00	0.01	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.08	0.38	0.00	0.00	0.04	0.00	0.00	0.05	0.04	2.78	0.28	1.07	42.30	2.61	1.32
40134005	AZ	Maricopa	62.3	62.3	0.15	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.08	0.33	0.00	0.00	0.03	0.00	0.00	0.03	0.05	2.82	0.24	1.26	38.02	2.39	1.49
40134008	AZ	Maricopa	65.6	66.5	0.21	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.00	0.00	0.03	0.00	0.00	0.03	0.06	2.45	0.18	1.91	41.47	2.52	1.15
40134010	AZ	Maricopa	63.8	66.9	0.25	0.00	0.00	0.01	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.00	0.26	0.28	0.00	0.00	0.04	0.00	0.01	0.04	0.04	2.56	0.19	2.09	40.08	2.39	1.03
40137020	AZ	Maricopa	67.0	67.0	0.19	0.00	0.00	0.01	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.12	0.27	0.00	0.00	0.02	0.00	0.00	0.03	0.14	3.14	0.20	1.42	40.07	2.50	2.39
40137021	AZ	Maricopa	69.8	70.1	0.14	0.00	0.00	0.01	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.08	0.34	0.00	0.00	0.03	0.00	0.00	0.03	0.12	2.98	0.26	1.44	43.64	2.54	1.06
40137022	AZ	Maricopa	68.2	69.1	0.14	0.00	0.00	0.01	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	0.08	0.34	0.00	0.00	0.03	0.00	0.00	0.03	0.12	2.91	0.26	1.41	42.64	2.48	1.03
40137024	AZ	Maricopa	67.0	67.9	0.19	0.00	0.00	0.01	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.12	0.27	0.00	0.00	0.02	0.00	0.00	0.03	0.14	3.14	0.20	1.42	40.07	2.50	2.39
40139702	AZ	Maricopa	66.9	68.1	0.14	0.00	0.00	0.01	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.00	0.00	0.04	0.00	0.00	0.05	0.08	2.84	0.28	0.89	43.39	2.26	1.10
40139704	AZ	Maricopa	65.3	66.2	0.14	0.00	0.00	0.01	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	0.09	0.35	0.00	0.00	0.03	0.00	0.00	0.03	0.07	2.62	0.22	1.30	42.20	2.33	1.16
40139997	AZ	Maricopa	70.5	70.5	0.18	0.00	0.00	0.01	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.12	0.28	0.00	0.00	0.03	0.00	0.00	0.04	0.06	3.05	0.23	1.78	43.46	2.49	1.97
40218001	AZ	Pinal	67.8	69.0	0.15	0.00	0.00	0.01	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	0.09	0.34	0.00	0.00	0.04	0.00	0.00	0.06	0.04	2.70	0.28	0.90	47.09	2.31	1.20
80013001	CO	Adams	63.0	63.0	0.24	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.11	**0.91**	0.00	0.00	0.02	0.00	0.00	0.36	0.11	0.76	0.07	1.09	38.82	2.53	1.63
80050002	CO	Arapahoe	68.0	68.0	0.34	0.00	0.00	0.00	0.00	0.01	0.08	0.00	0.00	0.00	0.01	0.00	0.12	**1.46**	0.00	0.00	0.03	0.00	0.00	0.42	0.19	0.81	0.10	1.24	40.78	3.08	1.40
80310002	CO	Denver	63.6	64.8	0.24	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.11	**0.92**	0.00	0.00	0.02	0.00	0.00	0.36	0.11	0.76	0.07	1.10	39.19	2.55	1.65
80310026	CO	Denver	64.5	64.8	0.25	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.12	**0.93**	0.00	0.00	0.02	0.00	0.00	0.37	0.12	0.77	0.08	1.11	39.75	2.59	1.67
90079007	CT	Middlesex	68.7	69.0	0.05	**10.22**	0.65	0.11	**2.25**	0.14	0.03	**5.11**	0.04	0.23	0.04	0.42	0.56	0.03	0.03	**1.39**	0.06	**1.63**	0.17	0.07	0.00	1.95	0.88	0.20	17.97	5.63	0.77
90110124	CT	New London	65.5	67.0	0.02	**12.08**	0.43	0.06	**1.70**	0.14	0.01	**3.81**	0.08	0.16	0.02	0.27	0.55	0.01	0.00	**1.02**	0.04	**0.82**	0.18	0.03	0.00	2.86	0.94	0.19	16.83	5.13	0.56

Appendix F

Design Values and Contributions for Violating Monitor Receptors in 2023—Part 2					Contributions																									
Site ID	ST	County	2023 Avg	2023 Max	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	WV	WI	WY	TRIBAL	Canada & Mexico	Off-shore	Fires	Initial & Boundary	Bio-genic	Light-ning NOx
170310032	IL	Cook	67.3	69.8	0.09	0.22	0.00	0.30	**1.39**	**0.72**	0.04	0.25	0.00	0.00	0.07	0.00	**1.40**	0.05	0.01	0.01	0.07	0.07	**2.21**	0.08	0.00	1.15	0.14	0.21	17.74	9.65	1.12
170311601	IL	Cook	63.8	64.5	0.05	0.28	0.00	0.35	**1.49**	0.47	0.03	0.34	0.00	0.00	0.06	0.00	**0.78**	0.02	0.01	0.02	0.06	0.09	**1.63**	0.06	0.00	1.97	0.06	0.15	18.33	9.07	0.83
181270024	IN	Porter	63.4	64.6	0.08	0.10	0.00	0.24	**0.90**	0.63	0.03	0.16	0.00	0.00	0.05	0.00	**1.32**	0.03	0.00	0.01	0.06	0.07	**2.25**	0.05	0.00	0.85	0.13	0.33	17.02	9.39	0.86
260050003	MI	Allegan	66.2	67.4	0.09	0.00	0.00	0.26	**0.93**	**1.14**	0.04	0.10	0.00	0.00	0.06	0.09	**1.68**	0.07	0.00	0.00	0.07	0.11	**5.10**	0.20	0.01	0.45	0.11	0.30	16.97	10.93	0.85
261210039	MI	Muskegon	67.5	68.4	0.10	0.00	0.01	0.12	**1.20**	**1.20**	0.03	0.12	0.00	0.01	0.03	0.21	**1.52**	0.06	0.00	0.02	0.05	0.17	**2.62**	0.16	0.00	0.38	0.17	0.38	14.54	10.31	0.78
320030043	NV	Clark	68.4	69.4	0.14	0.00	0.00	0.00	0.00	0.02	0.08	0.00	0.00	0.00	0.00	0.00	0.13	0.23	0.00	0.00	0.02	0.00	0.00	0.01	0.00	1.94	0.35	2.13	42.30	2.26	1.78
350011012	NM	Bernalillo	63.8	66.0	**6.58**	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	**0.78**	0.18	0.00	0.00	0.00	0.00	0.00	0.01	0.19	1.66	0.09	1.26	45.54	2.12	2.46
350130008	NM	Dona Ana	65.6	66.3	**1.69**	0.00	0.00	0.00	0.00	0.12	0.03	0.00	0.00	0.00	0.00	0.00	**3.83**	0.08	0.00	0.00	0.02	0.00	0.00	0.06	0.02	10.77	0.14	0.84	39.98	2.39	3.52
361030002	NY	Suffolk	66.2	68.0	0.03	**12.55**	0.45	0.09	**1.98**	0.19	0.02	**5.20**	0.00	0.09	0.04	0.23	0.59	0.02	0.00	**1.19**	0.04	**1.18**	0.13	0.06	0.00	2.33	0.83	0.29	17.82	5.28	0.63
390850003	OH	Lake	64.3	64.6	0.05	0.30	0.03	0.12	**18.66**	0.30	0.06	**1.63**	0.00	0.00	0.04	0.26	**0.78**	0.05	0.01	0.14	0.08	**1.79**	0.66	0.14	0.00	1.55	0.07	0.20	17.01	8.36	0.78
480290052	TX	Bexar	67.1	67.8	0.19	0.00	0.00	0.12	0.00	0.32	0.00	0.00	0.00	0.00	0.01	0.07	**18.42**	0.04	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.42	0.50	0.36	39.80	3.56	0.89
480850005	TX	Collin	65.4	66.0	0.18	0.00	0.00	0.08	0.08	0.29	0.02	0.00	0.00	0.04	0.04	**0.74**	**27.06**	0.05	0.00	0.00	0.03	0.00	0.02	0.15	0.01	0.53	0.47	0.73	19.31	6.79	0.72
481130075	TX	Dallas	65.3	66.5	0.15	0.00	0.00	0.18	0.11	**1.57**	0.02	0.00	0.00	0.01	0.12	**0.86**	**21.71**	0.05	0.00	0.00	0.04	0.00	0.02	0.17	0.00	0.35	0.29	0.91	21.85	7.05	0.55
481211032	TX	Denton	65.9	67.7	0.09	0.00	0.00	0.11	0.06	0.47	0.02	0.00	0.00	0.00	0.06	**0.77**	**23.85**	0.06	0.00	0.00	0.04	0.00	0.02	0.21	0.00	0.28	0.41	0.68	21.27	7.16	0.55
482010051	TX	Harris	65.3	66.3	0.04	0.00	0.01	0.04	0.03	0.22	0.00	0.00	0.00	0.01	0.02	0.43	**26.47**	0.02	0.00	0.00	0.01	0.00	0.01	0.04	0.00	0.28	2.23	0.75	19.77	4.70	0.73
482010416	TX	Harris	68.8	70.4	0.05	0.00	0.02	0.08	0.02	0.28	0.00	0.00	0.00	0.01	0.04	0.41	**28.63**	0.02	0.00	0.01	0.01	0.00	0.01	0.05	0.00	0.34	2.25	0.75	20.23	5.29	0.89
484390075	TX	Tarrant	63.8	64.7	0.10	0.00	0.00	0.14	0.09	**1.34**	0.02	0.00	0.00	0.00	0.08	**0.70**	**24.97**	0.06	0.00	0.00	0.04	0.00	0.02	0.16	0.01	0.27	0.25	0.70	20.26	6.75	0.78
484391002	TX	Tarrant	64.1	65.7	0.15	0.04	0.20	0.15	0.06	**1.57**	0.02	0.05	0.00	0.15	0.08	0.59	**24.06**	0.07	0.00	0.06	0.05	0.01	0.02	0.19	0.01	0.40	0.27	0.89	20.50	6.15	0.86
484392003	TX	Tarrant	65.2	65.9	0.10	0.00	0.00	0.16	0.09	**1.55**	0.02	0.00	0.00	0.00	0.10	**0.74**	**24.84**	0.05	0.00	0.00	0.07	0.00	0.02	0.20	0.01	0.32	0.17	0.79	20.99	6.67	0.71
484393009	TX	Tarrant	67.5	68.1	0.09	0.00	0.00	0.15	0.07	**1.45**	0.02	0.00	0.00	0.00	0.10	0.64	**27.69**	0.05	0.00	0.00	0.06	0.00	0.02	0.19	0.00	0.32	0.25	0.88	21.28	6.32	0.64
490571003	UT	Weber	69.3	70.3	0.06	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.03	**8.27**	0.00	0.00	0.11	0.00	0.00	0.30	0.04	0.66	0.11	1.73	48.73	3.70	0.43
550590025	WI	Kenosha	67.6	70.7	0.10	0.12	0.00	0.20	0.67	0.56	0.05	0.10	0.00	0.00	0.05	0.11	**1.83**	0.06	0.00	0.00	0.08	0.02	**5.37**	0.12	0.00	0.95	0.17	0.21	16.06	11.81	1.20
550890008	WI	Ozaukee	65.2	65.8	0.07	0.19	0.02	0.21	**0.95**	0.54	0.04	0.38	0.00	0.00	0.04	0.11	**1.24**	0.05	0.00	0.06	0.08	0.14	**8.21**	0.10	0.00	1.02	0.11	0.21	15.86	11.31	1.05

Appendix F

Appendix D

Upwind State Collective Contribution in 2023

This appendix provides the 2023 average design values, "home state" contributions, total contributions from all upwind states, and the total upwind contribution expresses as a percent of total ozone (i.e., the 2023 average design value) at each receptor (ppb).

Table D-1. Monitor plus modeled receptors.

Site ID	State	County	2023 Average DV	Home State Contribution	Upwind State Contribution	Upwind Contribution as a Percent of 2023 Average DV
40278011	AZ	Yuma	70.4	2.97	6.96	9.9%
80350004	CO	Douglas	71.3	15.68	5.67	8.0%
80590006	CO	Jefferson	72.8	16.82	5.10	7.0%
80590011	CO	Jefferson	73.5	17.54	4.90	6.7%
80690011	CO	Larimer	70.9	13.99	5.22	7.4%
90010017	CT	Fairfield	71.6	4.59	39.86	55.7%
90013007	CT	Fairfield	72.9	3.94	40.05	54.9%
90019003	CT	Fairfield	73.3	2.52	41.80	57.0%
90099002	CT	New Haven	70.5	3.85	36.83	52.2%

Appendix F

Site ID	State	County	2023 Average DV	Home State Contribution	Upwind State Contribution	Upwind Contribution as a Percent of 2023 Average DV
170310001	IL	Cook	68.2	18.8	17.66	25.9%
170314201	IL	Cook	68.0	23.46	15.88	23.4%
170317002	IL	Cook	68.5	20.58	18.84	27.5%
350130021	NM	Dona Ana	70.8	2.87	6.98	9.9%
350130022	NM	Dona Ana	69.7	2.89	5.83	8.4%
350151005	NM	Eddy	69.7	6.52	5.19	7.4%
350250008	NM	Lea	69.8	10.23	5.04	7.2%
480391004	TX	Brazoria	70.4	29.21	10.79	15.3%
481210034	TX	Denton	69.8	28.72	10.99	15.7%
481410037	TX	El Paso	69.8	3.17	4.22	6.0%
481671034	TX	Galveston	71.5	19.31	18.47	25.8%

Appendix F

Site ID	State	County	2023 Average DV	Home State Contribution	Upwind State Contribution	Upwind Contribution as a Percent of 2023 Average DV
482010024	TX	Harris	75.1	31.24	7.81	10.4%
482010055	TX	Harris	70.9	28.74	11.23	15.8%
482011034	TX	Harris	70.1	28.33	9.91	14.1%
482011035	TX	Harris	67.8	27.4	9.58	14.1%
490110004	UT	Davis	72.0	8.72	5.08	7.1%
490353006	UT	Salt Lake	72.6	9.15	5.42	7.5%
490353013	UT	Salt Lake	73.3	7.49	4.55	6.2%
550590019	WI	Kenosha	70.8	5.51	36.91	52.1%
551010020	WI	Racine	69.7	7.98	34.08	48.9%
551170006	WI	Sheboygan	72.7	7.22	34.76	47.8%

Table D-2. Violating monitor receptors.

Site ID	State	County	2023 Average DV	Home State Contribution	Upwind State Contribution	Upwind Contribution as a Percent of 2023 Average DV
40070010	AZ	Gila	67.9	7.65	3.19	4.7%
40130019	AZ	Maricopa	69.8	15.32	3.42	4.9%
40131003	AZ	Maricopa	70.1	13.83	4.16	5.9%
40131004	AZ	Maricopa	70.2	14.56	2.81	4.0%
40131010	AZ	Maricopa	68.3	13.90	4.24	6.2%
40132001	AZ	Maricopa	63.8	12.84	2.96	4.6%
40132005	AZ	Maricopa	69.6	13.81	3.01	4.3%
40133002	AZ	Maricopa	65.8	13.59	2.66	4.0%
40134004	AZ	Maricopa	65.7	11.01	4.26	6.5%
40134005	AZ	Maricopa	62.3	12.29	3.69	5.9%
40134008	AZ	Maricopa	65.6	13.06	2.76	4.2%
40134010	AZ	Maricopa	63.8	12.31	3.05	4.8%

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Site ID	State	County	2023 Average DV	Home State Contribution	Upwind State Contribution	Upwind Contribution as a Percent of 2023 Average DV
40137020	AZ	Maricopa	67.0	14.42	2.68	4.0%
40137021	AZ	Maricopa	69.8	14.25	3.47	5.0%
40137022	AZ	Maricopa	68.2	13.92	3.39	5.0%
40137024	AZ	Maricopa	67.0	14.42	2.68	4.0%
40139702	AZ	Maricopa	66.9	12.53	3.48	5.2%
40139704	AZ	Maricopa	65.3	12.20	3.15	4.8%
40139997	AZ	Maricopa	70.5	14.56	2.85	4.0%
40218001	AZ	Pinal	67.8	9.81	3.43	5.1%
80013001	CO	Adams	63.0	13.94	4.00	6.3%
80050002	CO	Arapahoe	68.0	14.72	5.63	8.3%
80310002	CO	Denver	63.6	14.08	4.04	6.4%
80310026	CO	Denver	64.5	14.27	4.09	6.3%
90079007	CT	Middlesex	68.7	5.39	35.86	52.2%

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Site ID	State	County	2023 Average DV	Home State Contribution	Upwind State Contribution	Upwind Contribution as a Percent of 2023 Average DV
90110124	CT	New London	65.5	6.76	32.19	49.1%
170310032	IL	Cook	67.3	17.27	19.98	29.7%
170311601	IL	Cook	63.8	17.08	16.26	25.5%
181270024	IN	Porter	63.4	15.38	19.39	30.6%
260050003	MI	Allegan	66.2	2.02	34.51	52.1%
261210039	MI	Muskegon	67.5	1.98	38.90	57.6%
320030043	NV	Clark	68.4	9.05	8.53	12.5%
350011012	NM	Bernalillo	63.8	6.58	3.86	6.1%
350130008	NM	Dona Ana	65.6	1.69	6.21	9.5%
361030002	NY	Suffolk	66.2	12.55	26.43	39.9%
390850003	OH	Lake	64.3	18.66	17.64	27.4%
480290052	TX	Bexar	67.1	18.42	3.10	4.6%

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Site ID	State	County	2023 Average DV	Home State Contribution	Upwind State Contribution	Upwind Contribution as a Percent of 2023 Average DV
480850005	TX	Collin	65.4	27.06	9.74	14.9%
481130075	TX	Dallas	65.3	21.71	12.54	19.2%
481211032	TX	Denton	65.9	23.85	11.65	17.7%
482010051	TX	Harris	65.3	26.47	10.35	15.8%
482010416	TX	Harris	68.8	28.63	10.37	15.1%
484390075	TX	Tarrant	63.8	24.97	9.77	15.3%
484391002	TX	Tarrant	64.1	24.06	10.92	17.0%
484392003	TX	Tarrant	65.2	24.84	10.66	16.3%
484393009	TX	Tarrant	67.5	27.69	10.08	14.9%
490571003	UT	Weber	69.3	8.27	5.58	8.1%
550590025	WI	Kenosha	67.6	5.37	31.77	47.0%
550890008	WI	Ozaukee	65.2	8.21	27.37	42.0%

Appendix F

Appendix E

Upwind Linkages for Individual Receptors in 2023

Appendix F

Upwind states linked to monitored plus modeled receptors in 2023.

Site ID	State	County	Receptor	Upwind States Linked to Individual Monitor Plus Modeled Receptors in 2023										
40278011	AZ	Yuma	Yuma	CA										
60650016	CA	Riverside	Temecula	CA										
60651016	CA	Riverside	Morongo	CA										
80350004	CO	Douglas	Chatfield	CA	UT									
80590006	CO	Jefferson	Rocky Flats	CA	UT									
80590011	CO	Jefferson	NREL	CA	UT									
80690011	CO	Larimer	Fort Collins	AZ	CA	UT								
90010017	CT	Fairfield	Greenwich	IN	MD	MI	NJ	NY	OH	PA	WV			
90013007	CT	Fairfield	Stratford	IL	IN	KY	MD	MI	NJ	NY	OH	PA	VA	WV
90019003	CT	Fairfield	Westport	IN	KY	MD	MI	NJ	NY	OH	PA	VA	WV	
90099002	CT	New Haven	Madison	IL	IN	KY	MD	MI	NJ	NY	OH	PA	VA	WV
170310001	IL	Cook	Alsip	IN	IA	MI	MN	TX	WI					
170314201	IL	Cook	Northbrook	IN	MI	OH	TX	WI						
170317002	IL	Cook	Evanston	IN	MI	MO	OH	TX	WI					
350130021	NM	Dona Ana	Las Cruces Desert View	AZ	TX									
350130022	NM	Dona Ana	Las Cruces Santa Teresa	AZ	TX									

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Upwind states linked to monitored plus modeled receptors in 2023.

Site ID	State	County	Receptor	Upwind States Linked to Individual Monitor Plus Modeled Receptors in 2023										
350151005	NM	Eddy	BLM	AZ	TX									
350250008	NM	Lea	Hobbs	AZ	CA	TX								
480391004	TX	Brazoria	Manvel Croix Park	AR	LA									
481210034	TX	Denton	Denton Airport	AR	LA	MS	OK							
481410037	TX	El Paso	UTEP	AZ	NM									
481671034	TX	Galveston	Galveston	AL	AR	LA	MS	OK						
482010024	TX	Harris	Houston Aldine	LA										
482010055	TX	Harris	Houston Bayland Park	AR	LA	MS								
482011034	TX	Harris	Houston East	AR	LA									
482011035	TX	Harris	Houston Clinton	AR	LA									
490110004	UT	Davis	Bountiful Viewmont	CA	NV									
490353006	UT	Salt Lake	Hawthorne	CA	NV									
490353013	UT	Salt Lake	Herriman	CA	NV									
550590019	WI	Kenosha	Chiwaukee Prairie	MI	MO	OH	TX							
551010020	WI	Racine	Racine	MI	MO	OH	TX							
551170006	WI	Sheboygan	Sheboygan Kohler Andrae	MI	MO	OH	TX							

Appendix F

Upwind states linked to violating monitor receptors in 2023.

Site ID	State	County	Receptor	Upwind States Linked to Individual Violating Monitor Receptors in 2023									
40070010	AZ	Gila	Tonto National Monument	CA									
40130019	AZ	Maricopa	West Phoenix	CA									
40131003	AZ	Maricopa	Mesa	CA									
40131004	AZ	Maricopa	North Phoenix	CA									
40131010	AZ	Maricopa	Falcon Field	CA									
40132001	AZ	Maricopa	Glendale	CA									
40132005	AZ	Maricopa	Pinnacle Peak	CA									
40133002	AZ	Maricopa	Central Phoenix	CA									
40134004	AZ	Maricopa	West Chandler	CA									
40134005	AZ	Maricopa	Tempe	CA									
40134008	AZ	Maricopa	Cave Creek	CA									
40134010	AZ	Maricopa	Dysart	CA									
40137020	AZ	Maricopa	Senior Center	CA									
40137021	AZ	Maricopa	Red Mountain	CA									
40137022	AZ	Maricopa	Lehi	CA									
40137024	AZ	Maricopa	High School	CA									
40139702	AZ	Maricopa	Tonto National Forest	CA									
40139704	AZ	Maricopa	Fountain Hills	CA									
40139997	AZ	Maricopa	JLG Supersite	CA									
40218001	AZ	Pinal	Queen Valley	CA									
80013001	CO	Adams	Welby	CA	UT								
80050002	CO	Arapahoe	Highland Reservoir	CA	UT								
80310002	CO	Denver	Denver Camp	CA	UT								
80310026	CO	Denver	La Casa	CA	UT								
90079007	CT	Middlesex	Middlesex	IN	KY	MD	MI	NJ	NY	OH	PA	VA	WV

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Site ID	State	County	Receptor	Upwind States Linked to Individual Violating Monitor Receptors in 2023									
90110124	CT	New London	Fort Griswold Park	IN	MD	MI	NJ	NY	OH	PA	VA	WV	
170310032	IL	Cook	South Water Plant	IN	IA	MI	OH	OK	TX	WI			
170311601	IL	Cook	Cook County Trailer	IN	MI	OH	TX	WI					
181270024	IN	Porter	Ogden Dunes	IL	MI	OH	TX	WI					
260050003	MI	Allegan	Holland	IL	IN	IA	KS	MO	OH	OK	TX	WI	
261210039	MI	Muskegon	Muskegon	AR	IL	IN	KY	MO	OH	OK	TX	WI	
320030043	NV	Clark	Paul Meyer	AZ	CA								
350011012	NM	Bernalillo	Foothills	AZ	TX								
350130008	NM	Dona Ana	La Union	AZ	TX								
361030002	NY	Suffolk	Babylon	IN	KY	MI	NJ	OH	PA	VA	WV		
390850003	OH	Lake	Eastlake	IL	IN	MI	PA	TX	WV				
480290052	TX	Bexar	Camp Bullis	LA									
480850005	TX	Collin	Frisco	LA	MS								
481130075	TX	Dallas	Dallas North	AR	LA	OK	TN						
481211032	TX	Denton	Pilot Point	AL	AR	MS	MO	TN					
482010051	TX	Harris	Houston Croquet	LA	MS								
482010416	TX	Harris	Park Place	AR	LA								
484390075	TX	Tarrant	Eagle Mountain Lake	AR	LA	OK	TN						
484391002	TX	Tarrant	Fort Worth Northwest	AR	LA								
484392003	TX	Tarrant	Keller	AR	LA	OK	TN						
484393009	TX	Tarrant	Grapevine	LA	MS								
490571003	UT	Weber	Harrisville	CA	NV								
550590025	WI	Kenosha	Kenosha Water Tower	IL	IN	MO	TX						
550890008	WI	Ozaukee	Grafton	IL	IN	MI	MO	OH	TX				